SCIENCE AND INDUSTRY

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1920—Thirty Years of Service to Construction—1950

Contractors and Engineers Monthly

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Vol. 47, No. 9 SEPTEMBER, 1950

Covering the Field

● Conemaugh Dam
As reported on page 5, the concrete gravity-type flood-control structure is rising within the first-stage cofferdam.

● Truck Loads Tested
An article on page 10, an editorial on page 4, cover the HRB's current truck-load tests on a concrete road in Maryland.

● Grade Separations
An old concrete one is demolished, a new concrete and steel one built (page 14).
A double-deck 13-track RR bridge is rebuilt with no traffic letup (page 63).

● Pipe Moved for Canal
A 54-inch water main had to be relocated (page 17) to dip under a canal for the Chain of Rocks project.

● Football Stadium
Quicksand and water failed to slow construction of the south's newest football stadium, described on page 22.

● Bituminous Paving
An improvement calls for slag-macadam base topped with hot-mix—page 27
A relocation involves bituminous-macadam base surfaced with plant-mix—page 53.

● Harbor Dredged
A 35-foot depth is assured once more in the Providence, R. I., harbor. Page 32.

● Concrete Paving
A special truck lane on hills marks the 7½-mile Indiana paving job followed in detail on page 37.

● Hospital Building
Roofing material and plant-mix laid in the foundation assure a watertight building from bottom up. Story on page 47.

● County Votes, Builds Roads
A $6,000,000 bond issue puts a 230-mile road system on the map; what's more, the money is spent wisely. See page 58.

● Roadside Development
Virginia has added 4 new waysides this year; her total is 50. Page 68 also describes her seeding and mulching rigs.

● Highway Maintenance
How Arkansas rehabilitates pumping concrete slabs with hot-mix is told, page 72.

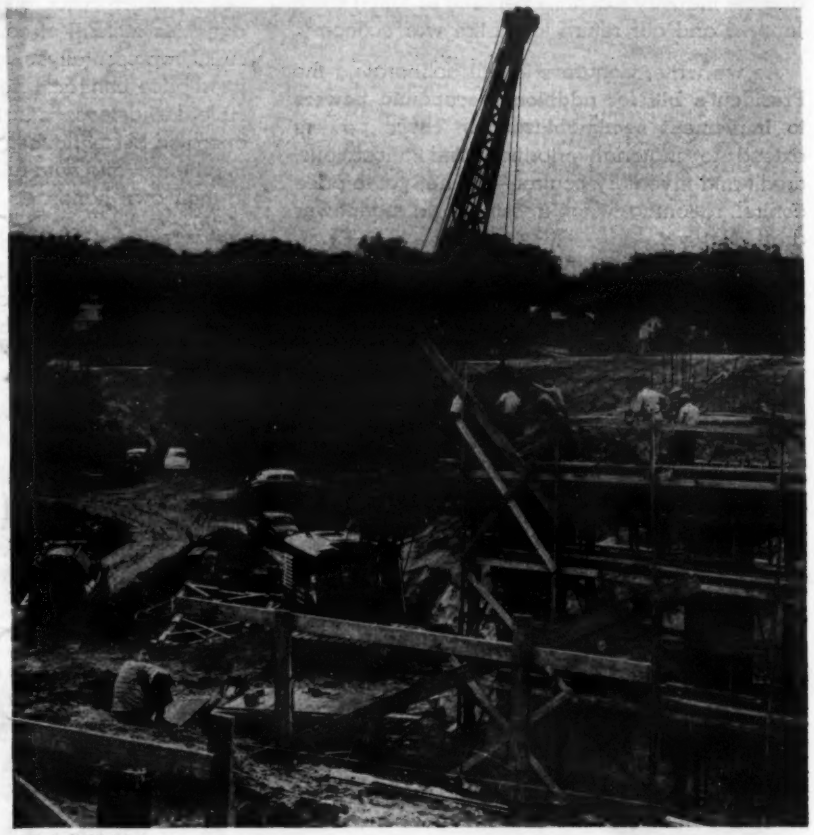
● Reservoir Lined
Asphalt membrane, a filter blanket, and dense earth fill go down in that order, as described and pictured, page 78.

● Sewage Plant
A movable elephant trunk instead of fixed tremies makes for digester-tank pours at a gallop. Read page 88.

● Concord Thru-Pass
Page 92 covers grading, gravel subbase, and two railroad overpasses for the 1.8-mile road which skirts the N. H. capital.

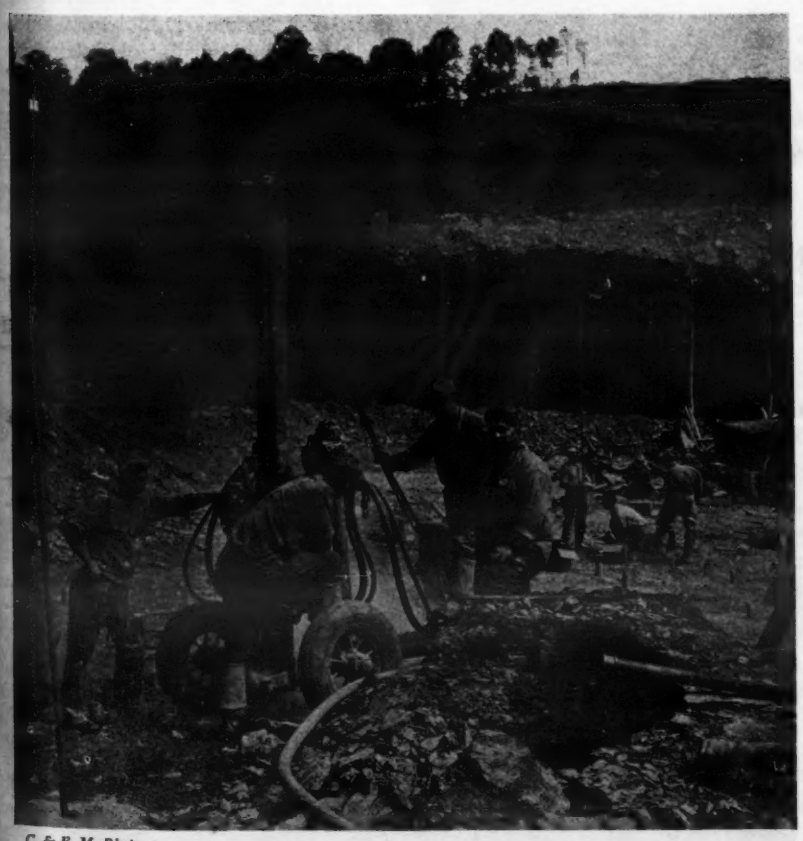
● Road-Base Stabilization
A county engineer evaluates, on page 95, the use of calcium chloride in crushed-stone stabilized bases.

(You will find "In This Issue" on page 4)



C. & E. M. Photo

HIGHWAY OVERPASSES. **The Concord Thru-Pass job described on page 92 included two overpasses to span Boston & Maine RR tracks. Here a Manitowoc Speedcrane lifts a bucket of concrete to the cap form of the center pier of one of the overpasses. Peter Salvucci held this N. H. contract.**



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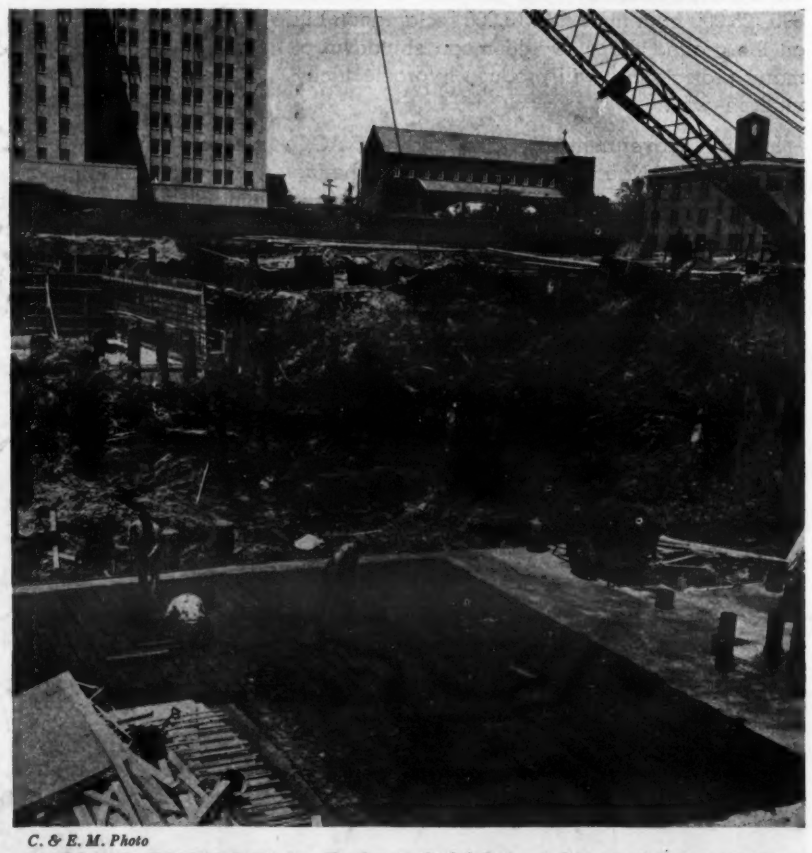
CONEMAUGH RIVER DAM. **"Who, us? Sure. Shoot!" Savin Construction Co. workmen and an Ingersoll-Rand wagon drill in the rock foundation of Conemaugh Dam, which will reduce the menace of floods to Pittsburgh, western Pennsylvania, eastern Ohio, and West Virginia. Turn to page 5.**



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BUILDING FOUNDATION. **Roofing material, but not for a roof—for a concrete leveling course in the subbasement of the new VA hospital in New Orleans (see page 47 for the McKee story) to make it watertight. The roofing material was continued up the sides of the foundation wall.**

NEWS AND VIEWS

of the construction industry at home and abroad—mobilization plans, Congressional, Presidential, and industry action so far

No one with a grain of sense is voicing predictions these days. And no one with an ounce of humility is placing much value on his own conjectures. So, all predictions and conjectures aside, let us review merely some of the Government's and the industry's actions pending or taken since June 25 and our return to partial war economy.

As we write, Congress is still deliberating the **President's bill for additional economic powers to implement semimobilization.** These powers extend to material priorities and allocations, credit and inventory control—but not yet to price control, rationing, wage freezing, or a manpower draft. Not yet.

Of immediate interest to the construction industry was **President Truman's order for restraints on home building** since "many materials used in residential and other construction will be required in increasing amounts for national defense purposes". His order tightens the rules for future Federal mortgage assistance on FHA and VA housing. It limits starts on the six-year public housing construction program to not more than 30,000 dwelling units in the last six months of this year . . . and suspends for the time being housing-construction loans to educational institutions.

He also asked Government agencies in general to review and modify their programs, to save materials and manpower better used for defense.

The BPR, with state help, is re-examining all F-A highway projects which are not yet advertised. As yet neither the Army Engineers nor the Bureau of Reclamation has announced any specific modifications. "Defense" is one key word in the rejection or retention of projects. "Power" is another. The Senate, for example, turned down the Paul Douglas (Illinois) amendment to trim $90,725,000 from the $294,713,000 reclamation bill on the ground that it would mean shutdown of many projects that will produce hydroelectricity vital in war.

In July, Goverment agencies and the AGC Committee on National Defense put their heads together to discuss **the contractor's role in current mobilization.** Until passage of appropriations bills, the agencies could hardly predict the size of defense construction programs, but they did stress the rehabilitation of various facilities throughout the country. They also asked that contractors equipped to take on defense contracts get in touch with district offices of awarding agencies instead of coming to Washington. The AGC representatives, on their side, urged that fixed-price contracts be awarded wherever possible for defense construction. They said they operated best with their organizations and equipment intact and with full control of job operations in their own hands.

J. F. Pritchard, President of the National Constructors Association, has urged the National Security Resources Board to set up a **joint industry-military advisory committee to develop mobilization plans for the construction industry.** During World War II, the 20 or so member companies of the association, which specialize in chemical plants, steel mills, and oil refineries, were all engaged in building production facilities for the war effort. Mr. Pritchard proposes that their collective experience be made available to the government for the uncertain days ahead.

Eugene Reybold, Executive Vice President of the ARBA, in a letter to members, echoes the Government's **warning against a rush of businessmen to "re-establish the Washington beachhead",** which can cripple rather than aid mobilization. He suggests that road builders, instead of "going the rounds" themselves, work through the ARBA to arrange necessary conferences with officials.

As for the **Chavez-Whittington Federal Highway Bill H. R. 7941,** the Senate unanimously passed on August 22 a trimmed-down $1,138,000,000 version of its bill for the 2-year period ending June 30, 1953. The Public Roads Committee, with Senate approval, clipped $240,000,000 from the $1,497,000,000 bill in response to a request from President Truman. The President had expressed concern over the proposed heavy expenditures on road building at a time "when we are attempting to conserve manpower and materials for our defense efforts." Then the Senate slashed off another $119,000,000 through the adoption of economy amendments. Rural roads bore the brunt of the Senate cut. As we write, the measure has gone to a Senate-House conference to iron out the differences with the $1,293,000,000 measure approved by the House. . . The earlier House bill directed the **apportionment of interstate funds** on the basis of population only. The Senate bill, however, specified the same basis as for primary funds: area, population, and mileage of rural mail routes. Highway officials of ten states of the North Atlantic seaboard objected to this amendment since it would cut their portion. They argued for the population basis because the construction of main trunk highways is most urgently needed where population, industry, and commerce are most highly concentrated. They also opposed a recommendation in the Senate bill that no state be considered eligible to receive F-A secondary-highway funds unless it has established a special Secondary Road Unit in its highway department.

Whatever the provisions of the act, and whenever it is passed, not even the wildest guessers care to say how much money will actually be appropriated for the 1952 road program when the time comes. Korea casts a long shadow.

A suggestive picture, these nervous days, of a mere peacetime explosion. The blast was the largest of a series which blew out a 5-foot-deep trench across the solid granite bed of the Tallapoosa River in Alabama to contain the 30-inch Trans-Continental Gas Pipeline.

Have you mobilized for winter? Though this is a simulated ambulance call to rescue a snowbound autoist, mercy missions to beat death and babies are frequent in Houghton County, Michigan. Here a Caterpillar No. 12 motor grader clears the way.

The pending appropriation bill provides $69,707,845 for military construction in Alaska. Here crushed gravel for the new International Airport at Anchorage spills into Ford F-8 tractor-semitrailers for a 3-mile run to the C. F. Lytle Co. job.

Wanted: Volunteers For Seabee Reserve

Skilled construction men 26 through 44 can still enlist in the Naval Reserve as Seabees and receive petty-officer ratings equal to their civilian experience, the Navy has announced. Volunteers will be placed on inactive duty, with no drills or required meetings. If called to active duty, they will retain their ratings and will have reasonable assurance of being assigned to naval construction battalions for high-speed building and defense of overseas bases.

The seven Seabee ratings open cover some 60 different civilian construction skills. These ratings are builder, mechanic, steelworker, utilities man, construction electrician, driver, and surveyor. Depending on the kind and amount of civilian experience, volunteers will be rated at some point between Chief Petty Officer, with minimum active-duty base pay of $198.45 a month, to Third-Class Petty Officer, with a minimum of $117.60. Additional pay is given for dependents and for years of previous service.

If previously with the navy service, volunteers will be accepted up to age 50½ years, plus the number of years of naval service. About 70,000 more men are wanted in the Seabee Volunteer Reserve.

For information, get in touch with the commanding officer of any organized reserve construction battalion company or volunteer construction battalion reserve unit. These are located in more than 300 principal cities in the country. Application can also be made at any naval recruiting station.

Traffic Loads on Bridges

As the effect of vehicle loading on concrete road slabs is being tested in Maryland (see page 10), a method for determining its effect on bridges and other highway structures is reported in Bulletin No. 116 issued by the Texas Engineering Experiment Station of the A. and M. College of Texas. Data presented in the booklet result from work completed to date on Research Project No. 92, a joint undertaking of the Station and the Bureau of Public Roads.

The study seeks to develop methods by which the proper live load for the design of bridges and other highway structures may be determined. Satisfactory methods for this purpose would also be useful in rating heavy vehicles and old bridges, and in establishing a realistic basis for legislation to govern the limitation of vehicle sizes and weights. The material is in no sense complete, but the methods of the study, the authors believe, are sound and point the way toward the ultimate solution of many practical problems involving highway traffic and heavy vehicle loads.

The report was prepared by Henson K. Stephenson, Professor of Structural Engineering of the A. and M. College of Texas, and A. A. Jakkula, Executive Director of the Texas A. and M. Research Foundation. To secure a copy, address the Texas Engineering Experiment Station, College Station, Texas. Single copies are available gratis.

ASTM Annual Meeting

The 53rd Annual Meeting of the American Society for Testing Materials, held in Atlantic City, June 26 to 30, broke previous records with a registered attendance of 2,134. Papers and reports were presented at 23 formal technical sessions, and during the week there were 500 meetings of ASTM technical committees. Recommendations from these committees resulted in 68 new specifications and tests, with revisions in some 200 existing standards and tentatives. These will be published separately and in the 1950 Supplement to the "1949 Book of ASTM Standards".

Methods of testing soils under triaxial loading were described in ten papers in a two-session symposium. A symposium on identification and classification of soils was of interest to many men working in this field.

L. J. Markwardt, Assistant Director, U. S. Forest Products Laboratory, Madison, Wis., was elected President of the Society for 1950-51, succeeding James G. Morrow, who will be on the Board of Directors as Past President for three years. T. S. Fuller, Engineer in Charge of Works Laboratory, General Electric Co., Schenectady, N. Y., is the new Vice President to serve with the Senior Vice President, F. E. Richart, Research Professor of Engineering Materials, University of Illinois, Urbana, Ill.

Foremen Safety Talks

More than 5,000 copies of "Safety Talks for Construction and Maintenance Foremen" have been distributed, the National Safety Council reports. This pamphlet, containing 58 tool-box talks on various aspects of construction safety, was made available late last year. It was a project of the NSC Construction Section, and was considered so constructive that other sections are developing similar foremen's talks for their industries.

Copies may be secured from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. Price: $1.50 per copy for NSC members; $3.00 per copy for nonmembers.

Heavy-duty pavement wanted here

26,899,212 vehicles crossed the Delaware River Bridge* last year. One out of nine vehicles was a truck or bus. Traffic over the bridge has reached a high for 92,612 for a single day and 241,856 for a three-day week-end.

*Connects Philadelphia, Pa. with Camden, N. J.

Constructing 8-lane Texaco Asphaltic Concrete pavement on the Delaware River Bridge with minimum interference to traffic.

Old granite blocks were removed to make way for heavy-duty Texaco Asphaltic Concrete, laid by Union Paving Company, Philadelphia.

This 6-lane Texaco Asphalt pavement has been serving heavy Delaware River Bridge traffic for five years with slight maintenance.

As the above figures show, traffic on the Delaware River Bridge at Philadelphia is exceptionally heavy. Not often is a pavement called upon to withstand the severe and sustained traffic, which paving on this bridge gets day after day.

Because of the unusual traffic conditions, road builders will be interested in the use of hot-mix, hot-laid Texaco Asphaltic Concrete to pave an 8-lane section of the bridge this year. Old granite blocks were removed from a large area and replaced by two courses of resilient, heavy-duty Asphaltic Concrete, four to five inches thick.

Five years ago, another section of the Delaware River Bridge was paved with Texaco, employing both Asphaltic Concrete and Sheet Asphalt construction. This section has required virtually no maintenance. It is in excellent condition today and continues to give satisfactory service.

Wherever heavy-duty paving is required, whether for streets, highways, bridges or airports, the proven durability and low annual cost of Texaco Asphaltic Concrete merit careful consideration. For a full description of this and other asphalt types, write our nearest office for the booklet, "Texaco Asphalt Paving—Plant-mixed Types."

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TEXACO ASPHALT

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An Airlift for the U. S.?

Exploring possible avenues of defense for this country, engineers are beginning to ask themselves, "Could a 'Berlin Airlift' save the United States in case of war?"

The question is important. Vital sections of the nation can be cut off and dealt with. For example, less than a dozen bombs, placed in such key passes as San Gorgonio, Cajon, Donner, Hood River, and Snoqualime, can isolate Washington, Oregon, and California the moment the detonations take place. It is easy to visualize the confusion in these areas, and damage to the nation as a whole, that an attack would cause.

Precautionary steps to prevent such a catastrophe have, so far, been limited to thinking about the problem. Highway engineers speak of a general move to improve access roads to airports. County engineers are beginning to realize the importance secondary and local roads could assume in any mass exodus of people. Air Force, Army, and other military engineers say key western airfields like Muroc, Victorville, and Geiger are being strengthened or enlarged. Improvements at Muroc, while largely military, are slated to cost nearly $30,000,000. It all ties in with the possibility of an emergency.

W. R. McAtee, highway specialist, is currently with the CAA's Airport Service Division in Washington, D. C., studying the problem of improving access roads to airports. While the emphasis has been on routine betterment of civilian traffic flow, the beneficial aspects of such a program in case of war are not being overlooked.

The answer seems to boil down to strategic airfields, with ample feeder highways. Located inside and outside the exposed zones, they would make it possible for food, medicine, and reinforcements to come in.

In this connection, at least one speaker at the January meeting of the Airport Advisory Committee in Los Angeles touched upon the problem. Composed of prominent airport executives and managers from all over the nation, the Committee's function is to advise administrators on airport operation. The Committee is accelerating the thought that some of America's key civilian and military airports may become her lifeline. The next Committee meeting, in Miami, Fla., should see further development of this vital thought.

Railroad officials too are beginning to consider the problem. At least one prominent mayor, Fletcher Brown of Los Angeles, has pointed out in Washington, D. C., the necessity for better defense plans.

As this is written, we do not believe that total war is imminent or inevitable. Nevertheless, it is good to know that engineers and officials are now exploring the possibilities of the nation's vital airfield-highway system.

That should be good news to most Americans.

Practical Highway Research

Probably the most practical project ever undertaken by the Highway Research Board is under way on a mile-long stretch of highway in southern Maryland. (See page 10 for an article describing the test.) This test strip of 9-year-old concrete pavement is being pounded round the clock, 7 days a week, for a 6-month period by heavily weighted trucks to simulate the concentrated traffic conditions that are found on our major highways. Four sets of trucks with single-axle rear loads of 18,000 and 22,400 pounds, and tandem-axle rear loads of 32,000 and 44,800 pounds, are making the test. Will this section of road, in good condition at the start of the test, be in one piece at the end? Or will it be broken up and pounded out of shape as are so many of our roads?

The answers to these questions will be eagerly awaited by the entire transportation industry. For rail and water carriers have long claimed that the trucking industry is subsidized by the taxpayer, who bears the cost of rebuilding roads damaged by excessive loading of trucks. During the past year at various conventions of highway groups throughout the country, the Bureau of Public Roads has demonstrated pretty convincingly with models that overloaded vehicles permanently damage pavements. These present Highway Research Board tests are realistic, and naturally will carry more authority than any number of laboratory experiments even with precision-built models.

When the results of the tests are compiled and evaluated, a lot of interesting questions should be answered. The recommendation of the American Association of State Highway Officials for 18,000-pound single-axle loading should prove either well taken or too restrictive. The trucking industry contends that the breakup of our roads is due to the weather, or inadequate design and construction, and argues further that it is more than paying its share of the cost of road building and maintenance. One big truck operator even nails a sign to the rear of each of his vehicles stating that in the past year so many hundreds of dollars in taxes were paid on that particular truck. Was it too much, about right, or not enough?

The answer may be revealed when the trucks on the test strip end their monotonous grind in December. If the evidence shows that this pavement is seriously damaged by excessive loading, it is up to the various states to agree on a uniform nation-wide loading law, and see to it that such a regulation is enforced. On the other hand, if this pavement built on a good subgrade stands up, then the design and construction of pavements that have failed need to be scrutinized, and more durable roads built to take their place.

Yea to Cooperation Between AGC–USBR

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

We are appreciative of your interest in the continued growth of cooperation between the Bureau of Reclamation and the Associated General Contractors of America, as expressed in the excellent editorial "They Dynamited the Fence" which appeared in the June issue of CONTRACTORS AND ENGINEERS MONTHLY.

It is particularly gratifying to note your belief that contract costs can be lowered significantly by the furtherance of such cooperation between other Government agencies and contracting organizations. We feel that good working relations between the Bureau and the contractors represent a major contribution to the success of our accelerated reclamation and construction program.

Sincerely yours,
L. N. McClellan
Chief Engineer,
Bureau of Reclamation,
Denver, Colorado

Quarrying Must Run In the Isbell Blood

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

I have just read in your July issue [page 43] the fine writeup of Isbell Construction Co., Reno, Nev., and their work on U. S. Highway 50. I have no doubt these people are distant relatives of mine (my grandfather came here from Caroline County, Va., in 1815) but I never heard of the Reno Isbells before and would like to know more about them.

We are in the same business—U. S. Highways 43, 5, and 24, also 72 in northwest Alabama, all for 100 miles or more, were built of crushed limestone from Isbell Quarries over 30 years ago, and are in fine condition still.

Sections 1, 2, 3, and 4 of my quarry —over 1,000 feet front, with face 120 feet high in the center, extending back into the mountainside, some 10 acres or more—are now leased to E. C. Schroeder Co., Inc., and you will note that our [Franklin] County paper recently gave them a front-page writeup when we celebrated Alabama Industry Days. I tried to get extra copies of the paper, but they were all sold out in Russellville in less than an hour after the paper came out. My little grandson 9 months old got hold of my copy, and I was barely able to salvage a part of what he tore up.

Would like for you to return the [enclosed] paper and pictures after they have served your purpose, if any.

Yours very truly,
W. H. Isbell
Isbell Aglime Co.
Russellville, Alabama

We're glad you got it away from the little chap in time, for we read with interest the June 15 issue of the "Franklin County Times", which told how the Isbell Quarry is yielding as high as 40 cars daily of riprap limestone for flood control at Grenada and Greenville, Miss., under the Schroeder Co. $2,500,000 contract.

F-A to What Degree?

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

We agree with you that the problem discussed in your editorial [August, pg. 4, "'Unity' at What Price?"] is one of great importance to our entire highway program. The time is past due when states and local levels of government must assume their true responsibilities and not expect the Federal government to subsidize activities which are primarily of state and local importance.

We are in favor of Federal Aid to the degree which has existed since the Act of 1944, but we are not in favor of extending Federal-Aid subsidies on highways or on any other matter which would entail the states and local levels of government assuming a minor responsibility in matters of major importance.

The North Atlantic States have been pioneers in highway construction and are well ahead of the balance of the nation in assuming full responsibility for their actions. . . .

Very truly yours,
Ray F. Smock
Secretary of Highways
Pennsylvania Department of Highways
Harrisburg, Pennsylvania

Safety-Meeting Program

G. M. Read, Chief Engineer of E. I. du Pont de Nemours, will speak on "The Integration of Safety Into Actual Work" at the first session of the 2-day meeting of the Construction Section of the National Safety Congress and Exposition in the Stevens Hotel, Chicago, October 17 and 18. R. C. Reber, Field Project Manager of du Pont at Charleston, W. Va., will lead a panel discussion on "How to Do It".

The second day, G. W. Maxon, President of Maxon Construction Co., Inc., Dayton, Ohio, will speak on "Fixing Responsibilities for Safety on the Job". Mr. Maxon is Vice President of the Associated General Contractors of America.

The meeting will close with a clinic on safety problems. Panel participants will be Otto S. Holmskog, Senior Construction Engineer of Employers Mutual Liability Insurance Co.; L. H. Kornman, Division Superintendent of Stone & Webster Engineering Corp.; and Runar Anderson, Superintendent of Taylor & Gaskin.

J. A. DeLuca, Division Superintendent of du Pont, General Chairman of the Construction Section, will preside at all sessions.

Concrete Dam Rises Inside Cell Cofferdam

Cableway and 6-Yd. Buckets Place Concrete in Gravity Flood-Control Structure at Conemaugh, Pa.

By WILLIAM H. QUIRK,
Eastern Editor

(Photo on page 1)

✦ THE big Conemaugh Dam for Pittsburgh flood control is under construction within the first-stage cofferdam. Savin Construction Co. of East Hartford, Conn., is building the concrete-gravity-type structure under an $8,736,028 contract to the Corps of Engineers, U. S. Army, Pittsburgh District. Work at the dam site got under way in May, 1949, and the dam is scheduled for completion as an operating facility by the end of 1951.

This particular project is only part of the Corps of Engineers flood-control program in the Ohio River Basin, which includes 13 dams in western Pennsylvania. Over $14,000,000 worth of construction has gone into the relocation of a Pennsylvania Railroad 16-mile double-track line which was a necessary preliminary to the building of the dam and reservoir. The rail relocation involved the construction of six major bridges and a 2,660-foot tunnel, together with over 4,000,000 yards of earth and rock excavation. The railroad contracts started in April, 1946, and are being completed this year. (See C.&E.M., December, 1947, pg. 1.)

While flood control costs money, the loss from floods in life and property is immeasurable. This same Conemaugh River, now being dammed, took 2,209 lives in the famous Johnstown flood of 1889. As recently as March, 1936, 50 lives were lost and property was damaged to the extent of $212,500,000 in western Pennsylvania during spring floods which covered Pittsburgh's Golden Triangle business district with water. Flood crest at that time was 46 feet. In 1942 the waters again rose, this time to 11.6 feet above flood stage. When completed, the Conemaugh Dam will hold back vast stores of water and reduce the menace of floods to Pittsburgh and Ohio Valley communities in western Pennsylvania, eastern Ohio, and West Virginia.

Conemaugh Dam

Located about 30 miles east of Pittsburgh, the dam site on the Conemaugh River is 6 miles southeast of Saltsburg and 2 miles northeast of Tunnelton. The Conemaugh is a tributary of the Allegheny, which with the Monongahela becomes the Ohio River at Pittsburgh. The dam lies due east-west, with the river flowing south at this point between sharply rising hills. The concrete structure is 1,090 feet long, with an earth embankment running out on the right to give the barrier a total top length of 1,300 feet. The maximum height above foundation is 160 feet, and the greatest width through the base is 126 feet in the spillway section.

The 27 monoliths comprising the concrete dam are numbered from the right to the left bank. Except for No. 1, which measures 50 feet, they are all 40 feet long. Beginning at the right bank there is a 315-foot right-abutment section, then a 550-foot spillway that takes in part of monolith 8 and extends over into monolith 22, and a left-abutment section 225 feet in length. Outlet works in the spillway section include 13 sluices 5 feet 8 inches wide x 10 feet high. Their gates are hydraulically operated from within the dam, and their inlets are protected by trash racks. The spillway crest is at elevation 948.0, while the top of the abutment sections is 986.5 elevation.

On top of the ogee spillway section are 14 crest gates, to be furnished by the Government. They are 30 feet long x 27 feet high, and will be operated with a direct lift by two gantry cranes. The controlled spillway level of the reservoir is at elevation 975.0. The design discharge is 369,000 cfs with the pool at elevation 983.7. The gated section of the spillway is 420 feet long.

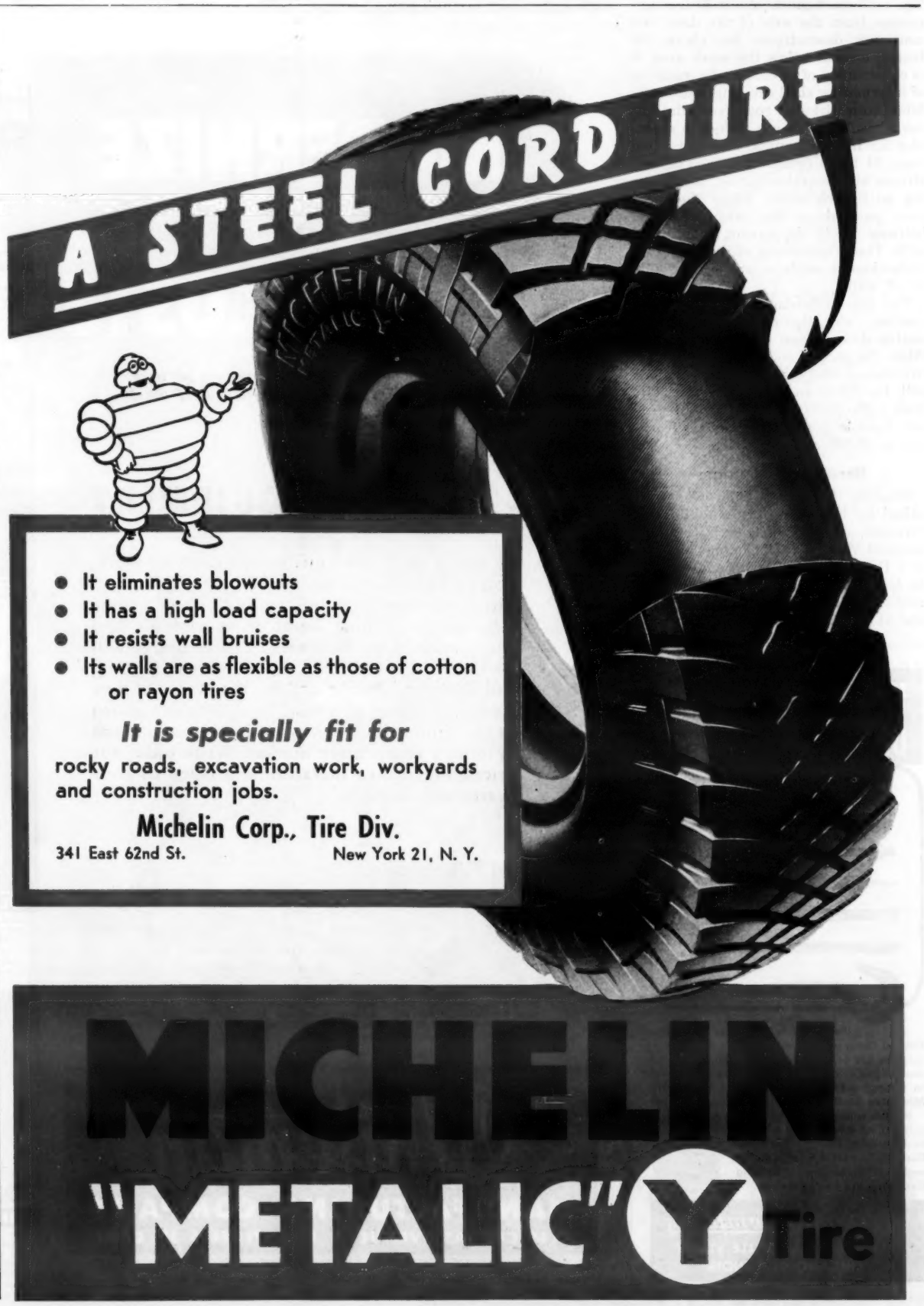
The axis of the dam is the vertical upstream face. In the abutment sections, the upstream face below elevation 943.0 has a 1 on 9 batter, while the downstream face is battered 7.5 on 10. In the spillway section, the upstream face is vertical to the foundation. On the downstream side the parabolic crown continues in its descent to tie in to the stilling basin. Inspection and work galleries run lengthwise through the dam.

Corps of Engineers Photo
Steel-sheet-pile cells make up the first-stage cofferdam within which the right side of Conemaugh Dam is constructed. This picture was taken in August, 1949.

Preliminary Operations

Savin Construction Co. set up its

(Continued on next page)


A STEEL CORD TIRE
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• It eliminates blowouts
• It has a high load capacity
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• Its walls are as flexible as those of cotton or rayon tires
It is specially fit for
rocky roads, excavation work, workyards and construction jobs.
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MICHELIN
"METALIC" Y Tire

Concrete Dam Rises Inside Cell Cofferdam

(*Continued from preceding page*)

plant and headquarters on the right bank of the river, and as one of the first steps in the plan of work built an access road 2,000 feet long in to the site from a township road. This eventually will be given a 16-foot pavement, bituminous surface, and will serve as a permanent approach up to the top of the right abutment of the dam. A ½-mile-long railroad spur was also constructed to the site from the relocated Pennsylvania railroad on which materials are delivered. Sidings go in to the concrete-mixing plant and to the aggregate-storage area. Downstream of the dam a 300-foot construction bridge was built to provide access to the left bank.

After the heavily wooded dam site was cleared and stripped, a first-stage cofferdam was built from the right bank within which is constructed the right side of the dam to include monolith 14. The cofferdam starts about 50 feet upstream from the axis of the dam, and continues downstream for about 400 feet to a point below the work area. It is constructed of circular cells made up of interlocking steel sheeting, and backfilled with dirt and rock from the excavation. The cells are 50 feet in diameter for the main units, with the piling from 24 to 40 feet in length. The upstream arm contains 6 cells, interlocking with each other, while the main arm, parallel to the river bank and halfway out in the stream, contains 10 cells. The downstream arm is an earth embankment with a steel-sheet pile cutoff wall.

The first cofferdam has an effective upstream elevation of 877.0, and an effective downstream elevation of 866.0. When the second cofferdam is built, its effective up and downstream elevations will be 880.0 and 866.0 respectively. Both cofferdams are designed to protect against a discharge of approximately 38,000 cfs.

Sheet-Pile Cofferdam

Sheeting 16 inches wide was furnished by both Jones & Laughlin and Carnegie, and was driven by an air-powered Vulcan No. 2 hammer handled by a Bucyrus-Erie 54-B crane. Air for the hammer and the rock drilling came from four compressors—2 Worthingtons at 500-cfm, a Chicago Pneumatic 500-cfm, and a Sullivan 630-cfm unit. The crane moved along from cell to cell as the backfill was placed within the circular walls. A steel template was used in the driving. The template had two parts, one above the other, which were leveled and adjusted by chain falls. Each part consisted of 4 circular arcs which were readily expanded to form a circle. This template was dismantled and set up for another cell in 1½ hours.

Corps of Engineers Photo
A Lidgerwood Travelift cableway was erected last winter for concrete pours inside cofferdam 1. That's a Gar-Bro bucket. The photo was taken in May of this year.

Two Fairbanks-Morse electric pumps, one 2,000 and one 1,000-gpm, as well as seven Jaeger pumps—two 6-inch, three 4-inch, and two 2-inch—were available for unwatering the cofferdam. Excavation then proceeded in the dry, the foundation consisting of sandstone, red clays, and shale. Rock was encountered in depths of 24 feet and was drilled by 6 Ingersoll-Rand wagon drills. Drill steel, 1¼ inches in diameter, was used in lengths of 6, 12, 18, and 24 feet, with bits ranging from 2½ to 1⅞ inches. The holes were charged with Hercules Gelamite 2 dynamite, averaging a yard of rock to a pound of powder. Up to 200 holes were fired at a time.

Excavation was handled by a Bucyrus-Erie 54-B 2½-yard shovel and a Northwest 1¾-yard shovel loading out

(*Continued on next page*)

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DRILL TAMPER—Whiteman Tamper leaves a "fat" surface for finish, makes dry topping unnecessary.

SCREED STAKE CAP—Make up own screed stakes on job. Instantly adjustable. Unnecessary to disturb stake.

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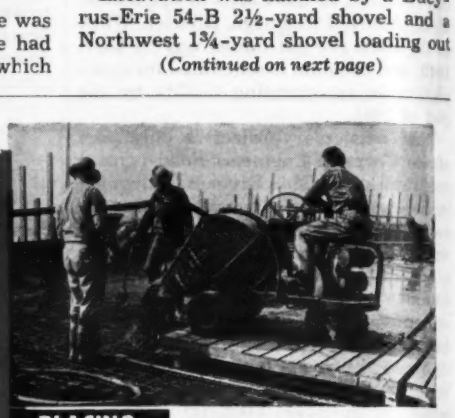
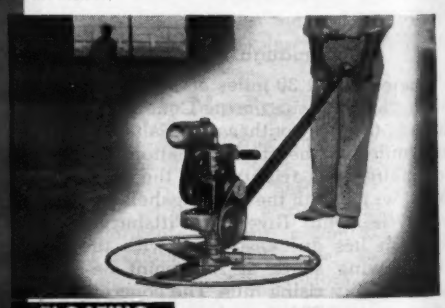
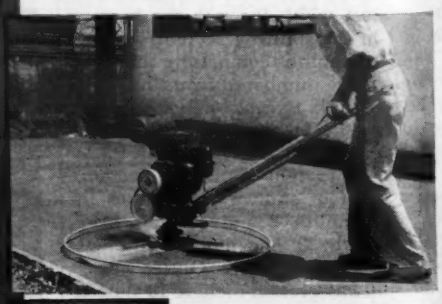


PLACING A Whiteman Power Buggy will carry as much concrete as six men with wheelbarrows and speed it up to 16 mph over soft earth, up 25% grades, to upper floors, over light scaffolds, through doorways. New dumping mechanism gives positive control of the dump. Powered by 7.5 h.p. 4-cycle air-cooled engine. Versatile, tough, dependable. Proved itself with large and small contractors for many years.

SCREEDING Whiteman Rodding Machine eliminates labor of hand screeding and greatly speeds operation. Rods the slab to a perfect level, puddles and vibrates the entire depth and area of concrete. Thoroughly compacts slab and brings moisture to surface for finishing operation. Rods up to 15-foot widths. 1½ h.p. gasoline engine.



FLOATING With float trowels attached, New Model B Whiteman Floating and Finishing Machine compacts the slab, drives out air pockets, brings up moisture and produces an excellent traction surface. Float trowels are easily snapped on or off in a few seconds... an *exclusive patented Whiteman feature* that is a great time saver.



FINISHING For finishing, the float trowels of the Whiteman Floating and Finishing Machine are quickly snapped off and the tool steel finish trowels are used. Pitch of trowels can be adjusted by control knob on handle while in operation . . another exclusive Whiteman feature that saves a tremendous amount of time. New design base and improved heavy trowel arms assure perfect alignment of trowels.

to 8 end-dump Euclids and 6 trucks. About half of the excavated material was wasted in a disposal area above the dam site, while the rest was used to fill the cofferdam cells, or stockpiled for road building around the dam or for the second cofferdam. A force of 75 men was employed on the drilling and excavation, working two 10-hour shifts, 6 days a week. Electricity for the job was supplied by the Penn Electric Co. over a special line brought in from Blairsville. Ten floodlights were set up on the right bank, and Le Roi light plants were also used for lighting the work area inside the cofferdam.

Concrete Plant

While the excavation was in progress, a Manitowoc Speedcrane with a 100-foot boom and 25-foot jib was setting up a Johnson concrete batch plant in the work area on the right bank. The plant holds 365 cubic yards of aggregate and 3,400 barrels of cement. On a platform below the material storage are three Koehring 2-yard mixers. Medusa cement, made to meet Federal specification SS-C-192-Type 2, with Darex air-entraining agent added at the construction site, is used in the mix; along with Ohio River sand from Davidson Co., New Kensington, Pa.; and stone from the Latrobe Construction Co., supplied by its Longbridge quarry near Ligonier, Pa. All material was delivered by rail. Wells near the site furnished water for the mix and curing. The maximum size of aggregate is 6 inches.

According to the contractor's plan of work, concreting got under way in October, 1949, and, before winter put an end to operations, the foundation rock within the first cofferdam was covered with concrete totaling around 25,000 yards. Concrete was placed on these low pours with bucket and crane, a Lima crawler and a Lima truck crane being brought into supplement the other excavators. Blaw-Knox and Irvington cantilever-type forms are in use, and as the concrete is placed it is vibrated with Chicago Pneumatic vibrators.

A feature of the mixing-plant setup was the 7-foot diameter Carnegie-Illinois copper-steel tunnel through which moves the aggregate for the concrete batch plant. The tunnel is 220 feet long, and houses a 30-inch conveyor belt which continues for 270 feet more after it leaves the tunnel and rises to the plant with either limestone or sand.

High Line

Last winter a high line was erected spanning the axis of the dam. This was used for placing concrete when work resumed in the spring. The high line consists of a Lidgerwood Travelift cableway with a span of 1,380 feet, strung between a head tower on the right bank and a tail tower on the left bank. The 82-foot head tower rolls on a 45-foot-gage track, while the 30-foot tail tower, also movable, operates with an 18.75-foot gage. They are powered by electric motors.

An 8-wheel track carriage moves over the 3-inch main cable at a conveying speed of 1,200 feet per minute. Its hoisting and lowering speed, 20-ton capacity, is 200 fpm; height of lift is 175 feet. Concrete is placed from the high line with Gar-Bro 6-yard buckets which are brought from the mixing plant to the head towers on flatcars. For night work, twenty-five 1,500-watt lights are placed 10 feet center to center on an endless line strung between the cableway towers and moved by a winch to the desired position to give full illumination on the work area.

Corps of Engineers Photo

By midsummer of this year, the portion of Conemaugh Dam inside cofferdam 1 was scheduled to rise to elevation 880. This photo was taken in June, 1950.

According to the construction program, by midsummer of this year the portion of the dam inside cofferdam 1 would rise about 60 feet, or to elevation 880. Monoliths 11 and 13, however, would be left lower, at elevation 852, for diversion purposes later. The second-stage cofferdam will be constructed out from the left bank to contain a work area in which monoliths 15 to 27 inclusive will be poured. The flow of the river will be accommodated by the sluices in the spillway section and the two diversion monoliths which will be completed with the third and final closure. Work within the second cofferdam is expected to start the latter part of this year. The mass concrete is placed in 5-foot lifts on a 5 per cent upstream slope. Refrigerating equipment kept the temperature of the concrete 68 degrees F or below during the placing.

Tunnel Plugging

Above the dam the river makes an

(*Concluded on next page*)

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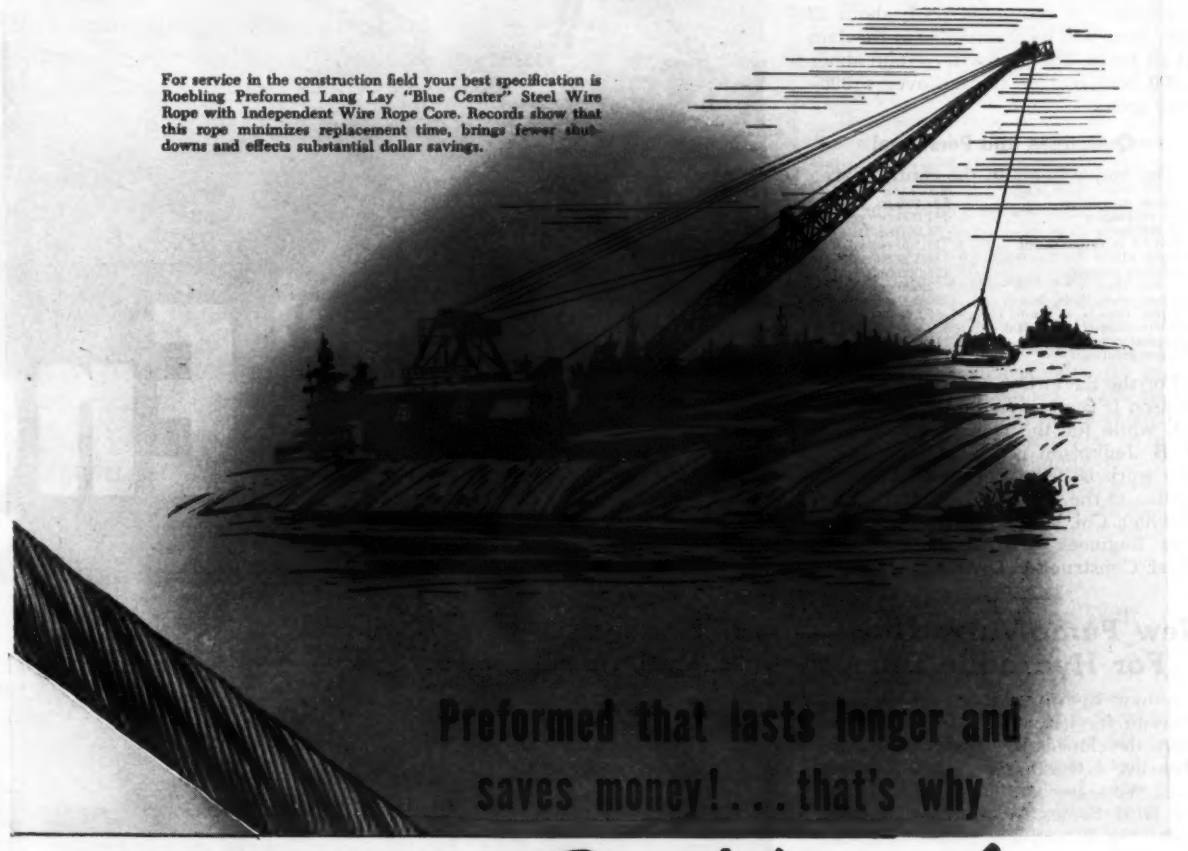
For service in the construction field your best specification is Roebling Preformed Lang Lay "Blue Center" Steel Wire Rope with Independent Wire Rope Core. Records show that this rope minimizes replacement time, brings fewer shut downs and effects substantial dollar savings.
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Concrete Dam Rises Inside Cell Cofferdam

(*Continued from preceding page*)

oxbow and reverses its direction so that a short distance downstream from the site it is on a parallel course. The narrow neck of land between the waters is pierced by three tunnels which had to be plugged to make the dam effective and prevent diversion from the reservoir to a point in the river below the dam. One tunnel carried a canal abandoned a century ago. The second tunnel served a railroad, also long since abandoned. The to-be-superseded Conemaugh Division of the Pennsylvania railroad currently is using the third tunnel until the relocation is completed. The tunnels average about 1,000 feet in length. The invert of one tunnel was 4 feet below the level of the top of the first-stage cofferdam. They are plugged with a concrete wall, 10 feet thick, which is keyed 3 feet into the rock around its perimeter.

The drainage area above the dam is 1,351 square miles. the reservoir will extend 17 miles back up the Conemaugh and 13 miles up Black Lick Creek to impound 274,000 acre-feet of water at total storage capacity, spillway crest elevation. A minimum pool, about 33 feet deep, will be maintained at the dam at all times. The pool will contain about 4,000 acre-feet of storage over a 300-acre area.

Quantities and Personnel

The major items in the contract are:

Common excavation	121,000 cu. yds.
Rock excavation	131,000 cu. yds.
Line drilling	33,000 sq. ft.
Rolled fill in embankment	17,500 cu. yds.
Random fill	36,500 cu. yds.
Furnishing cement	323,000 bbls.
Concrete, class A	2,600 cu. yds.
Concrete, class B, in dam	109,000 cu. yds.
Concrete, class B, in tunnel closures	1,315 cu. yds.
Concrete, class C, mass dam	222,000 cu. yds.
Steel reinforcing	746,000 lbs.
Pressure grouting	1,560 bags cement

For the Savin Construction Co. Dave Stinson is Superintendent on the project, while for the Corps of Engineers R. B. Jenkinson is Resident Engineer. The work is being done under the direction of the Pittsburgh District Office of which Col. Conrad P. Hardy is District Engineer. Wilfred Bauknight is Chief, Construction Division.

New Pump-Valve Unit For Hydraulic Dumps

A new hydraulic pump-valve combination for actuating dump units has been developed by The Commercial Shearing & Stamping Co., 1775 Logan Ave., Youngstown, Ohio. Known as the B101 Series, it is made in three sizes—1½, 2, and 2½ inches—and can be furnished with or without single or two-stage relief valves. The unit has an easy push-pull balanced-spool control valve with raise, hold, and lower positions. Two driveshafts are provided for connection to the power-takeoff shaft.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 129.

Viscosity of Lubricants

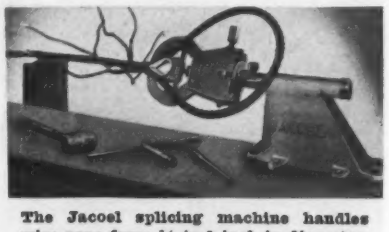
The May and June issues of "Lubrication", a technical publication devoted to the selection and use of lubricants, contain a complete article on the viscosity of lubricants. Copies are offered by The Texas Co., 135 E. 42nd St., New York 17, N. Y.

Of the six parts into which this article is divided, the first illustrates the simplest concept of streamline flow between two surfaces having relative motion. A series of torsion viscometers are pictured to show how viscosity acts and may be measured in this type of fluid flow. Part II covers streamline flow in capillary and other small tubes. This includes the efflux viscometers which are so commonly used in the petroleum industry. Part III covers turbulent flow as usually encountered in pipes; Part IV goes into detail on the effects of temperature and pressure on viscosity; and Part V deals with the Viscosity Index. A very brief reference to the nature of plastic flow is made in Part VI.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 35.

Wire-Rope Splicing

The Jacoel No. 9 splicing machine makes wire-rope splicing an exact science, according to its manufacturer, Quay Industries, 910 17th St., N.W., Washington 6, D. C. It is designed to assure a safe, neat, uniform splice and at the same time reduce labor and increase production.



The Jacoel splicing machine handles wire rope from ½ to 1 inch in diameter. It features swivel jaws and a resistance regulator for overcoming cable torque.

The Jacoel No. 9 will handle wire rope from ½ to 1 inch in diameter, the company states. It can be used for splicing around thimbles, bushings, spacers, fittings, etc., and for loops. It permits splicing wire ropes with a right or left-hand twist (Lang-lay or regular-lay wire ropes). The machine has swivel jaws, a resistance regulator which aids them in overcoming cable torque, and other features which permit one man to do the work of several.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 32.

McCulloch Promotions

Jean St. Henri and Kenneth Mulkey have been promoted to posts as factory sales representatives of McCulloch Motors Co. of Los Angeles. Both men have been members of the concern's Service Department, St. Henri for the past three years, and Mulkey for the last two.

A D386 "Cat" Engine powers this Manitowoc dragline, with 6-yd. bucket and 120-ft. boom, building levee on Galveston Bay. Owned by McGinnes Bros. Construction Co., Houston, Texas.

"Cat" Engines

BUILT FO

This crushing plant, owned by Arthur R. Alvis, Butler, Mo., has a "Caterpillar" D375 Engine driving a Universal pulverizer. Capacity, 125 tons of road rock per hour.

Two "Cat" D397 Electric Sets, each with capacity of 314 kw., furnish light and power for Cedar Bluff Dam construction job. Contractors, Lytle-Amis & San Orr, Ellis, Kans.

A New Portable Saw

An 8¼-inch portable saw designed for carpenters, small contractors, etc., has been produced by Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill. The Model 565 includes depth adjustment from 1/16 to 2⅞ inches and bevel adjustment from 0 to 45 degrees. These built-in adjustments permit fast work on such jobs as scoring plywood and bevel-cutting 2-inch lumber at 45 degrees, the company says.

Other specifications include a 115-volt universal motor for dc or ac up to 60 cycles, precision helical gears, ball bearings at points of greatest wear, comfortable handle with enclosed safety trigger switch, auxiliary hand grip on motor housing, safety telescoping blade guard, guide notches for straight or 45-degree cuts, die-cast aluminum-alloy housing, and a cutting speed of 5,000 rpm. Accessories include special blades for all types of wood, metal, stone and composition cutting.

Depth adjustments on Skilsaw's new 8¼-inch saw range from 1/16 to 2⅞ inches—bevel adjustments, from 0 to 45 degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.

Koehring Sales Appointments

R. E. Bansemer succeeds John E. Chadwick as Assistant General Sales Manager for the Koehring Co., Milwaukee, Wis. Mr. Chadwick has joined the Dalrymple Equipment Co., Koehring distributor in Mississippi. R. K. Patterson, C. Byron Walker, and A. W. Schlosser recently became Koehring district sales representatives in the New England, Pacific Northwest, and Southeast territories, respectively.

Connecting Links For Roller Chains

A connecting link with a bushed center plate has been developed for use with Diamond multiple-strand roller chain for severe service. This connector made by Diamond Chain Co., Inc., Indianapolis 7, Ind., provides durability closely matching that of Diamond multiple-strand chain with press-fit center plate. The chain can be connected and disconnected as easily as with links of slip-fit center-plate design; the handling of multiple-strand chains is simplified.

The new connectors are produced for Diamond multiple-strand roller chains of ¾ through 2½-inch pitch. They have file-hard bushings pressed into pitch holes of pairs of center plates making one unit, with the bushings then ground for hole and pitch accuracy. Since full support is provided across all strands, and both pins and bushings are hardened and polished, wear is greatly reduced, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

Laminated Wall Panel

New laminated panels designed to provide efficient, permanent curtain walls or interior partitions are offered by the Kaylo Division of Owens-Illinois Glass Co., Ohio Bldg., Toledo 1, Ohio.

The panels are a "sandwich" product 2 inches thick with faces of cement-asbestos board and an inorganic core of Kaylo insulation. They are also available with wood veneer and metal facings. The Kaylo material provides a core which is incombustible, lightweight, and strong, and offers insulating value as well as exceptional dimensional stability, the company states. The panels, nominally 2 inches thick, have an insulating value equal to 16 inches of concrete, it is claimed. Each standard 4 x 8-foot panel provides a complete wall section, 32 square feet in area, weighing about 200 pounds.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 52.

Mobile Tractor Drill

A new bulletin on the 105 Tractair Mobildrill, titled "Drive Your Light Wagon Drill and Compressor", is offered by Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis. It shows the combination tractor-compressor and light wagon drill in action and gives complete specifications and dimensions. The cost of the Mobildrill is compared with the cost of separate specialized pieces of equipment necessary to duplicate its work.

A separate case history called "One Day's Drilling Completed in Just Two Hours" shows the sequence of operations in drilling a pattern for an agricultural limestone quarry.

Bulletin T-16 and case history M6 may be obtained from the company, or by using the Request Card at page 16. Circle No. 5.

Lantern and Torch Stands

A circular describing Viateer lantern and torch holder stands has been prepared by Pucel Enterprises, Inc., 3746 Kelley Ave., Cleveland 14, Ohio. These stands will support highway torches, lanterns, and warning flags 9, 18, and 30 inches above the ground and are designed to reduce highway accidents and protect workmen. The literature points out that other models for dump-truck attachment are also available. The stands are illustrated in both support and folded positions.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 46.

BACK of the high preference for "Caterpillar" power on construction jobs is a long experience of profitable operation.

Construction men know they can depend on steady, day-in-day-out performance from "Cat" Engines and Electric Sets. And they know they'll get 24-hour service—anywhere—from "Caterpillar" dealers.

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When you order new construction equipment, specify "Cat" Diesel power. Your "Caterpillar" dealer will be glad to *show* you how the big yellow machines will meet your requirements.

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The built-in quality of "Caterpillar" Diesel Engines doesn't show on the outside—but it shows up in performance. Just take a few examples of the hundreds of hidden quality features that give "Cat" Diesels their long life and dependability.

"Caterpillar" intake and exhaust valves are made of highly alloyed, heat-resistant steels. Their ample size and close machining and heat-treat specifications have resulted in thousands of hours of trouble-free valve operation. Valve and rocker arm design are matched to reduce wear. Valves in the D397, D386, D375 and D364 Engines have special hard facings on contact surfaces, and have valve rotators and hardened valve seat inserts to reduce seat wear.

Fuel pumps are "Caterpillar"-designed and "Caterpillar"-built. Made of the cleanest high-chromium, high-carbon alloy steel obtainable, the pump plungers and barrels are diamond lapped. Pumps are heat treated to maximum hardness to give users thousands of hours of trouble-free, economical service. There is an individual pump for each cylinder. Pumps are free from adjustment and interchangeable.

The fuel injection valve offers owners maximum simplicity in design. Machined to extremely close limits, these valves are made from the finest quality materials — and are subjected to very detailed hardening processes. Valves are completely interchangeable and are adjustment-free. A large single orifice minimizes fouling. With the matched design of valves and precombustion chambers, owners use low-cost, non-premium fuels to get top economy.

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When Do Truck Loads Mean Road Overloads?

Trucks With Varied Axle Loadings Run 24 Hours a Day In Maryland to Test Effects On Concrete Paving

✦ OVER a 1.1-mile section of U. S. 301 in southern Maryland, eight trucks weighted down with heavy concrete blocks are running day and night to test the effect of concentrated traffic on a concrete pavement. This testing is a research project known as Road Test One—MD, and is being administered and conducted by the Highway Research Board of the National Research Council. Cooperating with the HRB in arranging the tests are highway departments of Connecticut, Delaware, Illinois, Kentucky, Maryland, Michigan, Ohio, Pennsylvania, Virginia, Wisconsin, and the District of Columbia; and the Bureau of Public Roads, Department of Commerce.

The test section, set aside by the Maryland State Roads Commission, is in Charles County south of Bel Alton. All traffic has been diverted away from this selected stretch of pavement, and directed onto a parallel black-top road which was improved especially to serve as a detour while the tests are being run. Trial runs with the trucks started June 12, and ten days later round-the-clock operations were in progress. Present intentions are to continue the tests for a period of six months. The results will be correlated when the project is completed.

The section of pavement selected for the test was laid in 1941 with two 12-foot lanes of concrete reinforced with No. 2-gage steel wire mesh. Each lane has a 9-7-9-inch pavement cross section. Contraction joints occur at 40-foot intervals, with every third joint being of the expansion type. An extensive crack survey of the pavement was made before the start of the tests. Size and location of such cracks were carefully noted. On the whole this section of pavement was somewhat better than the average nine-year-old concrete highway, having withstood normal traffic and seasonal weather changes with very little damage.

Four Different Loadings

The test pavement was divided into two sections, each about ½-mile long. Each half of the 24-foot highway was also set aside for the sole use of trucks with similar loading. Thus four separate testing strips were provided. In this way the effects of the loadings, from light to heavy, on the same pavement construction can be ascertained. Four bituminous turnarounds are provided, two at the center of the project and one at each end.

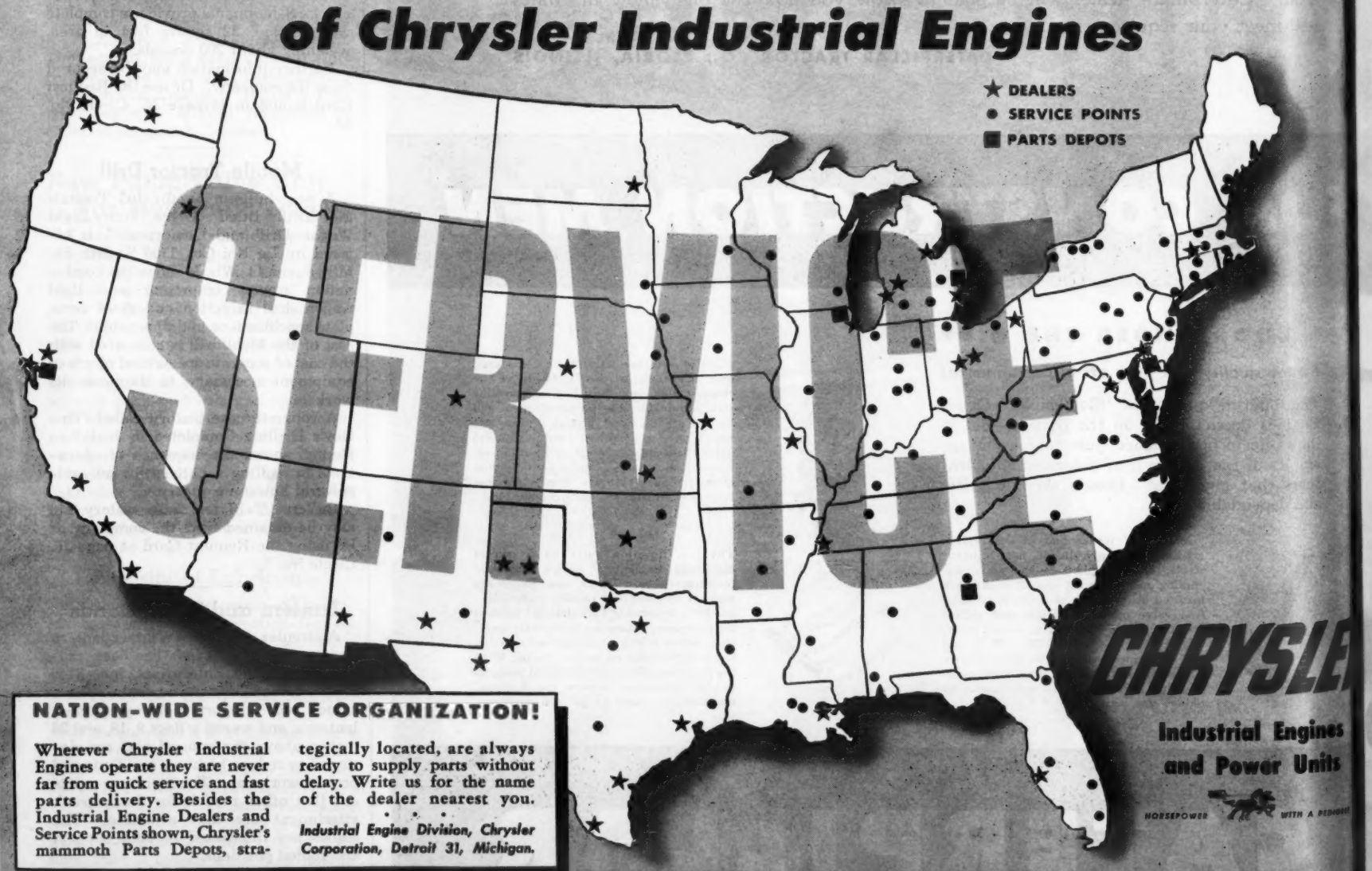
C. & E. M. Photo
A view of the highway where Road Test One—MD is taking place. Truck No. 1, a Ford, approaches the photoelectric cell counters.

Trucks with the comparatively lighter loads use the southerly half of the test pavement, while the heavier-laden vehicles operate over the north half. One of the southerly strips is used by a Ford and a Reo with a single-axle loading of 18,000 pounds; these trucks are designated No. 1 and No. 2 respectively. The paralleling ½-mile strip has been allocated to trucks No. 3, an Autocar, and No. 4, a GMC, using single-axle loadings of 22,400 pounds. Trucks No. 5, an International, and No. 6, a White, with tandem-axle loadings of 32,000 pounds, operate over one strip on the upper half of the test section. The remaining 12-foot lane, ½ mile in length, is used by trucks No. 7, a GMC, and No. 8, a Mack; both have tandem-axle loadings of 44,800 pounds.

Maryland law permits the operation of trucks with a single-axle load of 22,400 pounds, and tandem-axle load of 44,800 pounds. The American Association of State Highway Officials, however, recommends an 18,000-pound single-axle loading, and 32,000-pound

(*Continued on next page*)

THE GREAT INVISIBLE FEATURE
of Chrysler Industrial Engines



NATION-WIDE SERVICE ORGANIZATION!

Wherever Chrysler Industrial Engines operate they are never far from quick service and fast parts delivery. Besides the Industrial Engine Dealers and Service Points shown, Chrysler's mammoth Parts Depots, strategically located, are always ready to supply parts without delay. Write us for the name of the dealer nearest you.

• • •

Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.

loading for tandem-rear-axle trucks.

Constant Traffic

The tests call for the trucks to run back and forth over the parallel lanes the same number of times, at an average frequency of about one truck per minute on each of the four sections. They operate on a schedule of 24 hours a day, 7 days a week. Actually the running time per truck per day is about 19 hours, taking out time for servicing the trucks and rest periods for the drivers, who work 8-hour shifts. Shifts run from 2 a. m. to 10 a. m.; 10 a. m. to 6 p. m.; and from 6 p. m. to 2 a. m.

During the first hour of a shift, the drivers work the full 60 minutes. In each of the next three hours they get a 10-minute break, with a half-hour rest coming in the next working hour. A 10-minute break is also taken in the final three hours of the shift. Thus in an 8-hour shift the truck drivers receive six rest periods of 10 minutes and one of 30 minutes. Local help is now used as truck drivers, but it is expected that the U. S. Army will assign a Transportation Company to the project early in the fall as its contribution to this research which, of course, is of vital importance to national defense.

The trucks have been loaned to the Highway Research Board by their respective manufacturers. They are all driven by gasoline engines, with the cost of fuel, oil, and lubricants for their operation being contributed by 14 companies of the petroleum industry. Texaco products are being used, since they are handled by a local service station that also looks after the maintenance of the vehicles.

Precise Driving

There is more to this driving than just tooling a truck up and down a short piece of road. Each lane is marked out with stripes, and the drivers follow a set of instructions relating to these markings all the time they are behind the wheel. Each 12-foot lane has a white stripe along its outer edge. Two feet from the edge is a yellow stripe; 6 feet from the yellow is a white stripe. Two feet further is another yellow stripe which is also 2 feet from the center line of pavement. Trucks never pass over this inner two feet of pavement just off the center line.

Most of the driving, or a scheduled 60 per cent, is done with the wheels on each side being kept within the 2-foot strips outlined by the parallel white and yellow lines. Another 20 per cent is accounted for by driving the trucks inside the white lines which are 8 feet apart; this keeps the outside wheels close to the edge of the pavement. The remaining 20 per cent of driving is done within the 8-foot lane enclosed by the two parallel yellow lines. This schedule simulates normal traffic placement.

To keep the above schedule, micro switches were fitted on the trucks, usually just behind the front wheel. They control light panels mounted in the cab directly in front of the driver. The light panels contain one white and one yellow light which flash on and off automatically with relation to the micro switch that is actuated by the truck negotiating the circular turnaround. Switches and lights are synchronized to simplify things for the driver. When the yellow light flashes, he keeps the wheels of his truck inside the yellow lines on the pavement. When the white light flashes on, after completing a turn and reversing his direction, the driver holds his truck within the two white lines running out in front of him. When no lights show on the panel, he drives midway between the yellow and white lines, or about one foot off the edge of the concrete pavement.

Accurate Counting

In tests of this type it is necessary to keep an accurate count of the various loaded vehicles, so that the same number of passes are made over each test lane. To do this, photoelectric cell counters were set up with their beams crossing the highway at each half of the project. Each set of counters has two beams, one above the other. Signs showing the number of the trucks were fixed on the vehicles at different heights corresponding to their loading. Thus the position of these signs on the trucks is the instrument by which the beam of light is interrupted, and the passage of the vehicle counted by the photoelectric cell. In this way one set of counters records the movements of trucks No. 1 and No. 2; another counts No. 3 and No. 4, and so on. The count is also checked by careful records of the mile-

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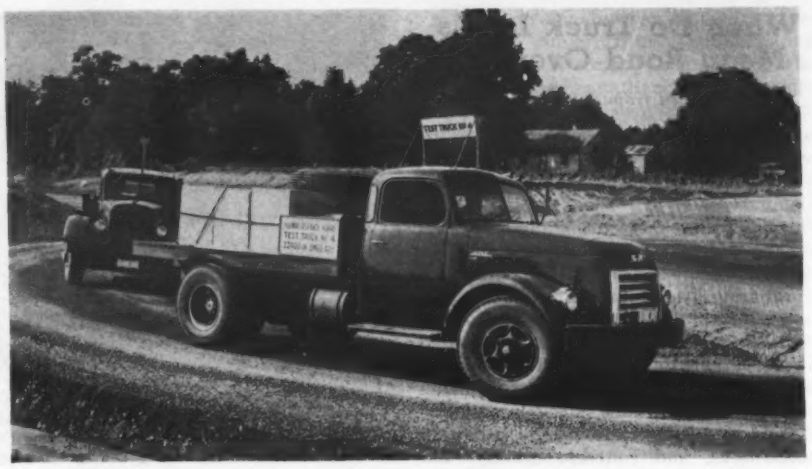


C. & E. M. Photo

Truck No. 4, a GMC, uses a turnaround on the HRB road test in Maryland. It has a single-axle loading of 22,400 pounds.

This Valve's only Lubricant is Wet Concrete...

yet* STOODY ALLOYS *keep it on the job!

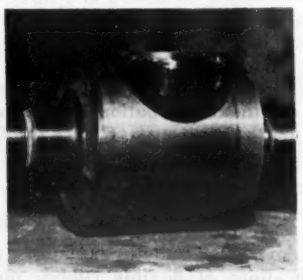
Take a look at this valve—it operates continuously in a bath of wet concrete, rotating in synchronism with the pump piston which lifts the slurry to place. We can't imagine a more abrasive operating condition, as concrete and sand combine to grind away valve clearances, causing leakage and quick destruction.

But the case is not hopeless... in fact, Stoody Alloys have increased life several times in this concrete pump. What's more, reclaiming expense is only half of new valve replacement cost. This is another typical example of profitable wear protection resulting from the use of the correct Stoody Alloy.

Why not refer your wear problems to your STOODY Dealer, or if you need detailed engineering advice, write direct. We're glad to help.

STOODY COMPANY

11936 EAST SLAUSON AVENUE, WHITTIER, CALIFORNIA



APPLICATION INFORMATION

¼" electrodes of coated Stoodite were applied electrically after preheating valve to 1200° F. (LEFT). *Temperature was maintained at 700° during welding and part was slow cooled in lime thereafter. Finish grinding completed the reclamation.* (RIGHT).

RICE

Self-Priming

CENTRIFUGAL PUMPS

Engine, belt, and electric driven pumps with many new features to give you outstanding performance at low cost. A.G.C. rated. Write for special bulletins.

RICE PUMP & MACHINE COMPANY

1049 S. 40th St. Milwaukee 4, Wis.

When Do Truck Loads Mean Road Overloads?

(*Continued from preceding page*)

age traveled by each truck while on the test lanes.

Concrete blocks weighing up to 960 pounds each are used to weight the trucks to the desired loading. A great mass of data was obtained even before the start of the tests. This included preliminary soil surveys and concrete-core tests. As the tests progress, other information is secured such as detailed observations of visible effects of the traffic on the pavement; measurements of surface elevations, stresses and deflections under wheel loads, subgrade conditions, and concrete quality will also be made.

Safety in the driving operations is continually stressed. The movement of trucks in opposing lanes is synchronized so that the two similarly loaded vehicles are at one end of the test section and ready to turn at the same time that the two trucks using the parallel lane are swinging around at the opposite end.

Personnel

Road Test One—MD is administered and supervised by the Highway Research Board through a project executive committee consisting of Fred Burggraf, Associate Director, Highway Research Board, Chairman; Albert S. Gordon, Executive Assistant to Chairman, Maryland State Roads Commission; T. J. Kauer, Director, Ohio Department of Highways; and H. S. Fairbank, Deputy Commissioner, Bureau of Public Roads, with the assistance of an advisory committee composed of representatives of the participating agencies that are financing the project by contributions. A. Taragin, Project Engineer directing the field operations, has been loaned to the Highway Research Board by the Bureau of Public Roads. Other field personnel, concrete and soil tests, instrumentation, and other services are also being furnished by the BPR.

New Welding Cable

A new type of welding cable for both electrode and ground is now available from the Lincoln Electric Co., Cleveland 1, Ohio. The outer cover of the Linconductor cable is Neoprene, and there is a paper separator 2½ mils thick between the outer cover and the copper stranding.

This cover, the company says, resists oil deterioration, flame burning, copper oxidation, abrasion, impact, fatigue, bending, and permanent set after stretching. The paper separator between outer jacket and copper is wound so that it laps over and around the conductors. The thin paper, plus the method of winding, is designed to give maximum flexibility and eliminate kinking. The copper stranding is a three-system rope lay which incorporates a new twisting method. Linconductor cable is available in the following sizes: 4/0, 3/0, 2/0, 0 and Nos. 1, 2, 4, and 6.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 146.

Flexible Rubber Pipe

An 8-page bulletin explaining the applications of flexible rubber pipe and comparing it to metal pipe in various services has been issued by Hewitt Rubber Division, Hewitt-Robins Inc., 240 Kensington Ave., Buffalo 5, N. Y. Economies in installation, maintenance, and length of life are explored in detail. A progressive picture story illustrates the ease of installation claimed for the rubber product. Case histories and applications are included.

Bulletin No. H-1 may be obtained from the company, or by using the Request Card at page 16. Circle No. 7.

Clearing-blade teeth on the new Carco dual-purpose blade unit, shown here mounted on an Allis-Chalmers HD-7 tractor, can be replaced by a lower blade section for dozing. The changeover requires no heavy gear.

Dual-Purpose Blade For Crawler Tractor

A new dozer and clearing blade in one has been developed by Pacific Car & Foundry, of Renton, Wash. Its clearing-blade teeth can be removed and replaced by a lower bulldozer blade section with a saving in time and labor and in blade inventory.

The Carco land-clearing blade features teeth of cast Fibraloy, which is said to have high tensile strength and high shock resistance. Tips are replaceable. Digging depth is varied by tipping the blade. Operation with the clearing blade or with the dozer blade is as usual. The bulldozer blade section has a regular cutting edge and corner bits for all types of dozer work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 114.

Carbide-Bit Reconditioning

A 20-page pocket-size booklet illustrating methods for reconditioning tungsten-carbide bits has been prepared by Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa. It presents the methods in picture-story form, and contains operating suggestions for obtaining maximum speed and footage with carbide bits. It also catalogs the company's Rok-Bits.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 96.

REDUCE COSTS of compressor operation by using the air compressor oils exactly suited to YOUR operating conditions . . . TEXACO

TEXACO

TEXACO

New Six-Wheel Trucks

Twelve new 6-wheel truck models with improved engineering and structural features have been introduced by International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., as elements of its L-line. They are designed "to give truck operators a big advantage in heavy-duty dump, ready-mixed concrete, logging, oil-field, tank, and tractor-trailer service, in hauling all kinds of heavy loads on or off the highway through deep sand, muddy fields and under other adverse conditions."

They have a gross-vehicle-weight range from 22,000 to 45,000 pounds and feature a new third differential mounted on the forward tandem axle. A single propeller shaft runs to the forward axle and from there, through the third differential, to the rear axle. This construction is said to be an improvement over the usual power divider and two separate propeller shafts. Other features include new valve-in-head engines; a new steering system; new steel-flex frames; new transmissions; a new bogie-to-frame mounting; and dual drive axles.

The LF-192, shown here with a concrete-mixer body, is one of twelve new International 6-wheel truck models. It has a gross-vehicle-weight rating of 35,000 pounds and is powered by the Super Red Diamond 406 engine.

The 6-wheel trucks, with their shorter wheelbases, wide-tread front axles, small turning circles, and new steering, offer maneuverability and good distribution of load between front and rear axles, the company says. They are powered by Super Blue Diamond and Super Red Diamond engines. Special 2 or 3-speed auxiliary transmissions with a low-speed gear are available to increase pulling ability for operations off the road. Other 2 or 3-speed auxiliaries for proper gear splitting are also provided for highway use. There is a choice of many axle ratios, which are coordinated with the transmission and auxiliary transmission to give the range of pulling power and road speed ordinarily required in 6-wheel trucks. Hydraulic brakes with vacuum booster are standard on all models, with air brakes optional. There is a choice of wheelbases.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

New Speed Reducers

Two new speed reducers, a concentric-shaft and a right-angle-shaft model, have been developed by The Falk Corp., Milwaukee 8, Wis. Featuring an improved all-steel housing, they are applicable for a variety of power-transmission requirements: electric-motor drives, belt drives, gasoline-engine drives, chain drives, etc. They may be used as either increasers or reducers.

The concentric-shaft speed reducer has output speeds ranging from 1 to 1,170 rpm and input speeds up to 1,750 and higher. It has a ratio range of 1.5 to 1 minimum and 970 to 1 maximum for an approximate operating range of 1 to 50 hp. The vertical right-angle speed reducer will handle output speeds from 1 to 350 rpm and input speeds up to 1,750 rpm. The ratio range is 5.7 to 1 minimum and 515 to 1 maximum, over an approximate horsepower range of 1 to 50. Both units are said to have a mechanical efficiency of 96 to 98½ per cent at full load.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 99.

Concrete-Form Stakes

Rigid corrugated-steel form stakes for curbs, walks, slabs, foundations, and for line stakes, etc., are manufactured by Walter B. Snook Enterprises, 751 Loma Verde Ave., Palo Alto, Calif. They are available in lengths of 14, 18. 24, 30, and 36 inches.

The company points out that the Krinkle-Steel stakes may be re-used many times and can be driven through hardpan that would shatter ordinary wood stakes. Their corrugated shape makes them nest easily in a small storage space. The stakes are drilled with 5/32-inch nail holes for easy fastening of wood forms.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 63.

Hose Couplings, Fittings

A new 12-page catalog section on hose couplings and fittings has been issued by the B. F. Goodrich Co., Akron 18, Ohio. It pictures and gives details on each type of coupling and fitting the company makes, together with specifications, general and maximum-pressure recommendations, and a description of threads.

The products include the following: common couplings, short and long shank; combination nipples, special suction-hose couplings, including the quick-action type, and interlocking high-pressure couplings; hydraulic hose couplings and hose adapter unions; Permalock couplings; Flexseal hose joint; BarWay reattachable couplings; inserted, built-on, and scored nipples; and pipe, flanges, hose clamps, and hose menders.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 43.

AIR COMPRESSORS operate under a variety of conditions—and there is no one oil that will do a highly satisfactory lubricating job under all of them. But there is a Texaco air compressor oil to meet every requirement. Follow the recommendations of your Texaco Lubrication Engineer and—whatever your conditions—you'll assure more efficient, more trouble-free performance . . . reduced wear and lower maintenance costs.

For instance, where conditions tend to produce rust in any part of the system, there are Texaco *rust-inhibited* air compressor oils designed to prevent it. If service is very severe and carbon and gum are problems, one of the Texaco *heavy-duty* air compressor oils will assure clean operation. Under "wet" cylinder conditions, use a Texaco *compounded* air compressor oil . . . and a Texaco *straight mineral* air compressor oil for normal conditions.

Also follow your Texaco Lubrication Engineer's recommendations for lubrication of your drills. *Texaco Rock Drill Lubricants EP* are "extreme pressure" lubricants designed to protect against wear and rust . . . assure longer life and lower maintenance costs.

Talk to a Texaco Lubrication Engineer about these cost-saving lubricants. Call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Old Viaduct Felled; New, Wide One Built

Steel and Concrete Structure Carries 73-Foot Roadway Over Tracks; Demolition Is Large Job Item

✦ THE largest single contract under way in the Alabama State Highway Department is the construction of the First Avenue Viaduct in the city of Birmingham. The new steel and concrete structure will carry U. S. 11 over several cross streets and the tracks of the Southern, Frisco, L. & N., and Seaboard Air Line railroads; also over several spurs entering the adjacent mills of the Sloss-Sheffield Steel & Iron Co. Construction got under way in March, 1949, and is scheduled for completion this month.

The original viaduct was built in 1914 at a cost of $239,070, and it extended along First Avenue from 26th Street to 31st Street. Just beyond the east end of the old bridge, the Seaboard Air Line tracks crossed the main artery of traffic at grade. This crossing is eliminated in the new structure, which extends from 25th Street to 35th Street. The overall length of the present project is 4,855 feet, comprising an 829-foot western approach; 2,954 feet of open bridge; and a 1,072-foot approach on the east. The approaches consist of retaining walls and enclosing earth fills leading up to the bridge abutments.

Over its 35-year life the old concrete bridge had nearly weathered away. In places the hand railing had completely disappeared. Some authorities attributed the disintegration to the acid-laden air resulting from the proximity of the great steel mills. At any rate its 40-foot roadway was too narrow for the heavy city traffic it carried, and it is being replaced with a modern structure in the same location. Traffic consequently was detoured at the start of the job to avenues paralleling the site. These other routes are at the same grade as the railroad tracks.

New Viaduct

The Alabama State Highway Department divided the project into three contracts. The initial contract, or proposal A, was awarded to the Frazier-Davis Construction Co. of St. Louis, Mo., on its low bid of $1,241,056 for removing the old bridge and building the approaches and the substructure for the new viaduct. The second contract, or proposal B, went to the Virginia Bridge Co. of Birmingham, Ala., for furnishing and erecting the structural-steel superstructure for the 500-foot section of viaduct spanning the L. & N. tracks. The contract included two major items—1,044,240 pounds of steel for the continuous built-up beams, and 13,605 pounds of spiral steel reinforcing; the estimated cost is $194,066. Proposal C, the third contract, covers the deck girder and slab construction for all the superstructure not included in B. It was awarded to Blount Brothers Construction Co. of Tuskegee, Ala., on a low bid of $955,992.81.

The substructure consists of 67 bents, numbered from west to east. Bents 22 through 26 are known as piers A, B, C, D, and E. They carry five girders across the tracks leading to the L. & N. Station; the girders are 4 feet 4½ inches deep. The spans at the piers are 86 feet, while most of the other spans are 41 feet, with a few exceptions at 31, 51, and 61 feet. The design loading of the bridge is H20-44.

Of the 67 bents, 42 are alike. These are 11 through 20; 30 through 56; and 59 through 63. The 42 similar bents have four columns spaced 21 feet on centers in the middle, and 20 feet on the outside. They rest on concrete footings and support arched caps; their average height is 40 feet. A 20-foot vertical clearance is obtained throughout the job. The approach grade at either end is 4.5 per cent.

Of the other bents the first ten have varying dimensions, but bents 21, 27, 28, 29, 57, 58, and 64 through 67 are similar. This like construction enabled the contractor to use steel forms for most of the concrete work, switching to wood only for the piers and the bents of varying sizes. The columns averaged 3 feet square, on footings 2½ feet deep and 6 to 7 feet square. The arched caps are 2½ feet wide x 3 feet deep at the center, and support a 73-foot roadway for six lanes of traffic, with a 4-foot walk on both sides. The reinforced-concrete superstructure consists of 8 girders and a 7⅛-inch deck slab. A concrete median strip divides the opposing traffic.

C. & E. M. Photo
Demolition at the west end of the old First Avenue Viaduct in Birmingham. Jackhammers cut concrete into sections over railroad tracks.

Demolition

In removing the old bridge, the contractor began operations by knocking the props out from under the concrete deck. This was done with a 3,800-pound steel ball swung from a Northwest crane with a 55-foot boom. The

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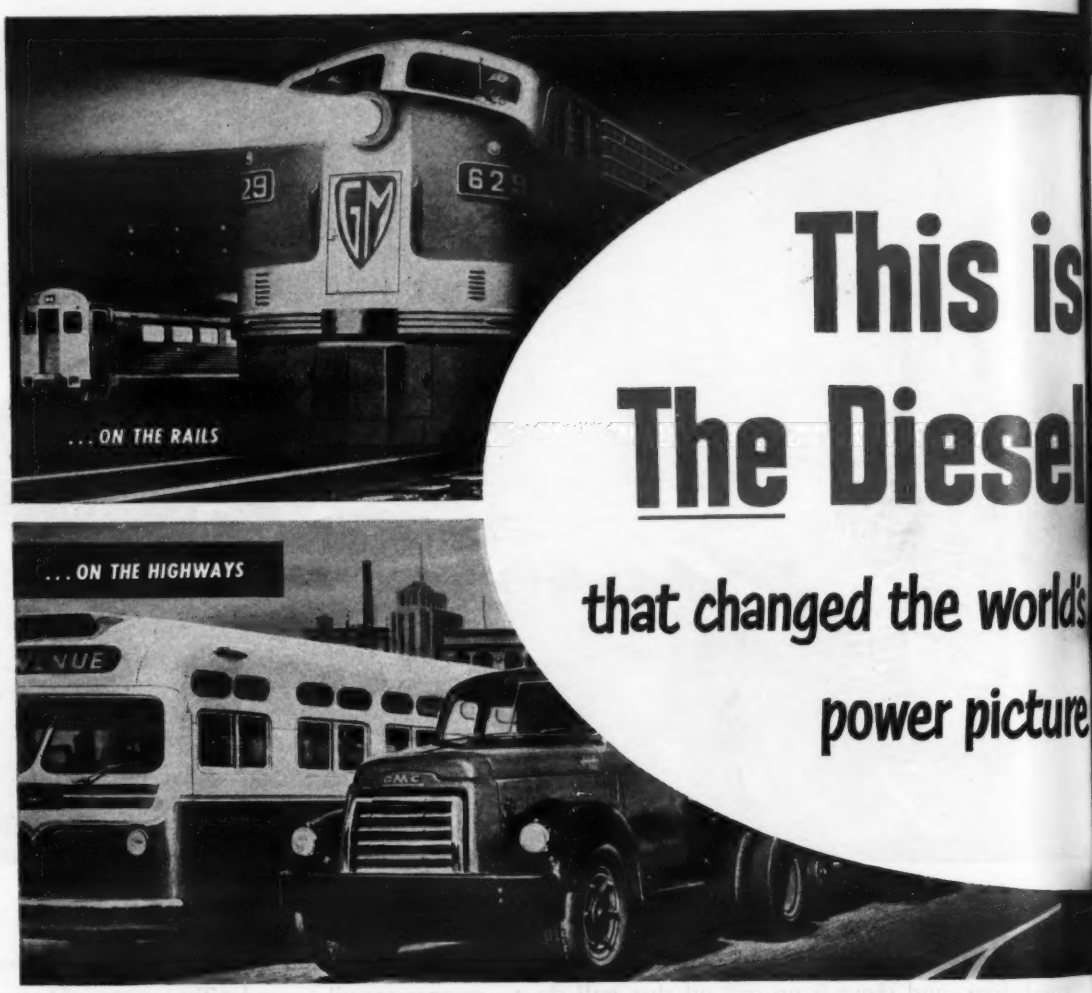


This is The Diesel that changed the world's power picture

ONE DIESEL—and one alone—blazed a trail which has won world-wide recognition for the oil-burning engine as the most economical source of smooth, dependable, agile power for locomotives, trucks, buses, marine and other mobile uses.

It is the General Motors Diesel engine, one size of which now drives most of America's crack passenger and freight trains. Another powers many of the Navy's submarines and other vessels.

And a third—the GM Series 71 engine—is the most widely used of all, totaling 46,000,000 horsepower. *It has surmounted the exacting conditions of War and met the economic requirements of Peace.* It has brought the same efficiency to a wide range of jobs, including many where Diesel power was never usable before.

That is because the "71," like all GM Diesels, is a two-cycle engine. Two-cycle means it produces power with every piston downstroke—in contrast to most other Diesels that generate power only on every second downstroke.

Equally important, GM Diesels have a direct jet-injection system that feeds fuel to cylinders in exactly metered charges—insuring better combustion and eliminating troublesome high-pressure fuel lines.

These basic differences make GM Diesels far more compact and much lighter than other Diesels of equal horsepower—without sacrificing ruggedness. These engines accelerate faster, are unmatched for smoothness, start quickly and are clean burning.

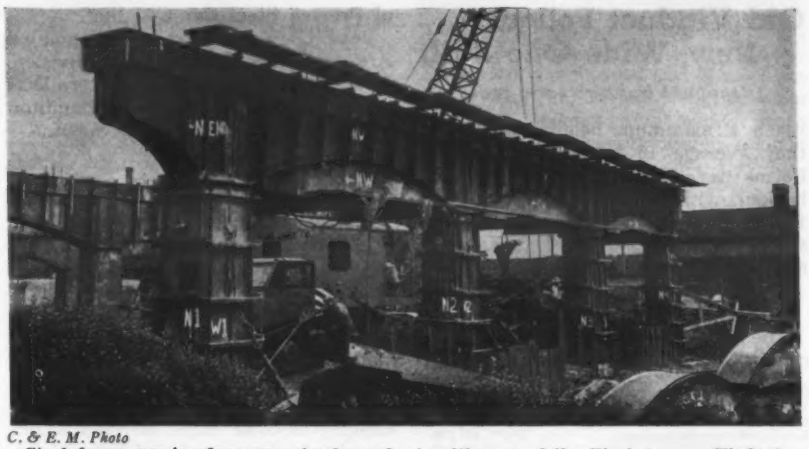
contractor's crane equipment included four Model 6 Northwests, and a Northwest truck crane; boom lengths ranged from 45 to 70 feet. At the start the crane worked from the ground, but as large sections of slab fell, it proved difficult for the ball to break these up, the tendency being to drive the concrete into the ground. So the crane was shifted up to the deck which the ball easily broke, the rubble falling to the ground below. The columns that remained were usually blasted out.

Where the old bridge spanned the railroad tracks, a different method was used. The deck was then cut up into pieces by jackhammers, and the cranes lowered these chunks into cars waiting on the tracks below. The rough squares of concrete rubble weighed from 5 to 10 tons each, and these were shipped to New Orleans, La., where they were placed as riprap on levees along Lake Pontchartrain.

As many as nine jackhammers were used in the demolition, including 6 Ingersoll-Rands, 2 Chicago Pneumatics, and a Gardner-Denver. They were powered by four compressors — two I-R's at 500 cfm; one CP at 500 cfm; and a Schramm at 210 cfm. They pumped air into two receivers, one at each end of the work.

Sheet-Pile Cofferdams

The bridge site is in a valley with a limestone floor. When faulty rock was encountered, the footings for the bents and piers were taken through the faulty strata to sound rock below. A minimum of 7 feet of solid rock was required for all footings. Nearly all the footings were built inside steel sheet-pile cofferdams which held back the surrounding crumbling material. Bethlehem SP7A sections were driven by a McKiernan-Terry No. 7 hammer powered by compressed air. The sheeting ranged in length from 15 to 23 feet, and the average size of a cofferdam was 15 feet square. The deeper holes were braced with 12-inch H-beams, while 12 x 12 timbers sufficed in the shallow ones. The rock was excavated after being blasted with Hercules 40 per cent dynamite, the drill holes being made with jackhammers. Pneumatic spades were used on the hard clay.



C. & E. M. Photo
Steel forms are in place on a 4-column bent, with cap, of the First Avenue Viaduct.

Ground water was a continuing problem over all the footing construction, and pumps were in constant use. The cofferdams were kept dry with one 3-inch and two 4-inch Humdinger pumps, and eight assorted 2-inch pneumatic sump pumps. When the footing and lower lift of the column was poured, the sheeting was pulled by a McKiernan-Terry E2 extractor for driving at another bent.

The footings usually extended 2 feet into solid rock, and the first lift above the footings was from 4½ to 6½ feet in height. Where wooden forms were used in the columns, they were built of 2-inch planking, faced with ¾-inch plywood, and backed with 2 x 8 horizontal collars on 18-inch centers. The steel forms, of ¼-inch minimum thickness, were made up specially for the job by the Mississippi Valley Structural Steel Co. of St. Louis. Three complete sets of column forms and two sets of caps were in use. Column forms had a maximum height of 36 feet. The steel ¼-inch plate was backed with vertical angles as studs, placed 12 inches on centers. Other angles, at varied spacing, served as horizontal wales. The sections were held together with alternately spaced pins and bolts for quick dismantling.

Concrete Placing

Ready-mixed concrete for the job was supplied from the adjoining Sloss-Sheffield Steel & Iron Co. The same mill also supplied slag for the coarse aggregate, while sand, the fine aggregate, came from the Dallas Sand & Gravel Co. at Plantersville, Ala. Lone Star and Alpha cements were used in the mix. Because of the blast furnaces in the area, Type 2, a sulphate-resisting cement, was specified. Smith 3 and 4-yard truck mixers mounted on Internationals delivered the concrete to the bents.

On the lower pours, the concrete was chuted directly into the forms. On the high pours it was discharged into Blaw-Knox 1-yard buckets which the cranes swung over the forms. As the concrete was placed it was vibrated with pneumatic vibrators of which there were six on the job—four CP's and two I-R's.

The steel forms were held in precise alignment, both lengthwise and sideways, with ⅝-inch cables securely anchored in the ground. Adjustments were made with steamboat ratchets. All reinforcing for the substructure was supplied by Ceco Steel Products Co. of Birmingham. (The Alabama Steel Co. of Birmingham furnished steel for the superstructure.) The concrete was placed in 3-foot layers as the columns went up; the order following the footing and stub, being first a 12-foot lift, and then usually a 20-foot lift. The cap forms were in place and lined up before the upper column lift was poured. The cap was generally poured the following day. After the concrete had attained a 2,400-pound strength, the forms were taken off. A strength of 3,000 pounds was attained in 28 days. The concrete was cured with Tru-Cure, a spray compound.

On the approach ramps the walls

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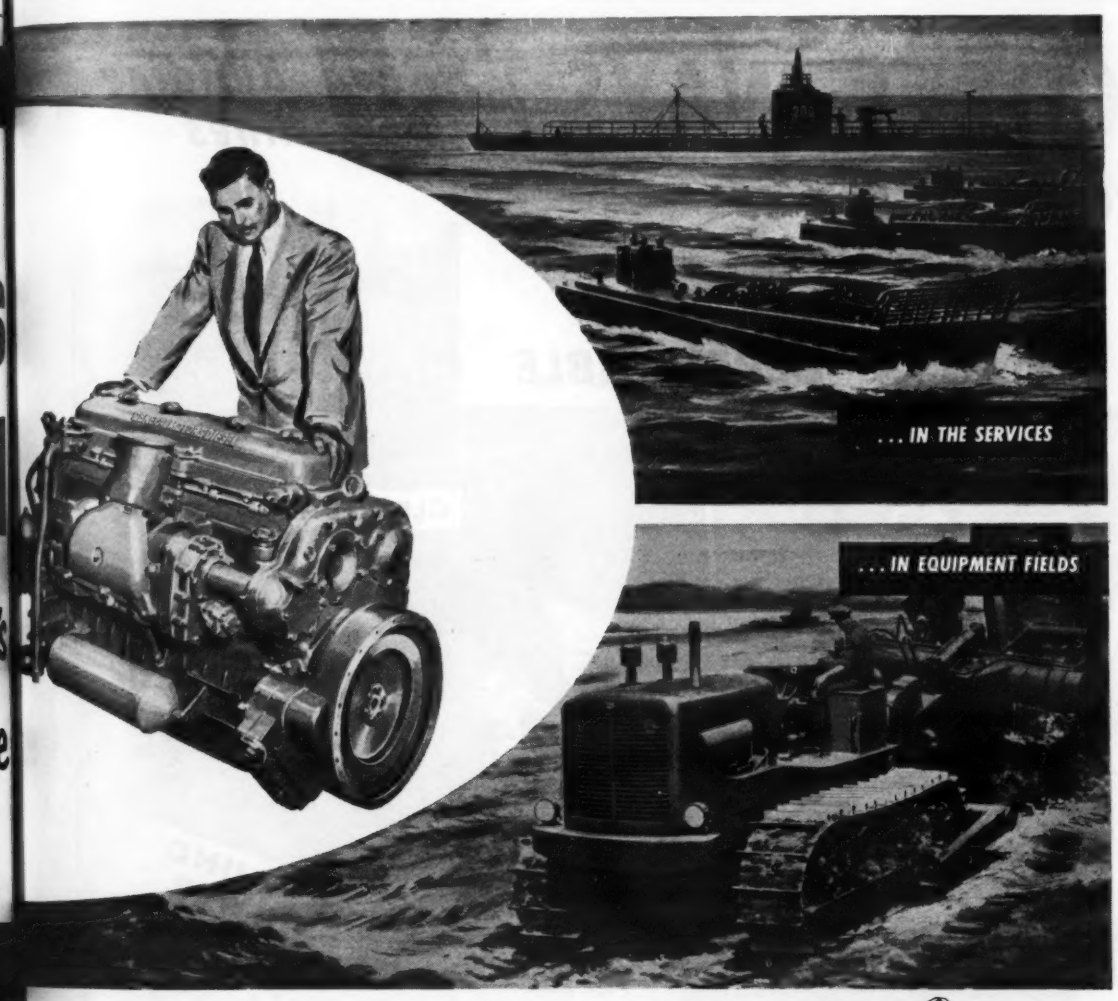

"Your Key to Power Economy"

Today, GM Series 71 Diesel engines are taking the place of gasoline engines on many types of power jobs — of steam engines on land and sea — even of other Diesels because twelve years' experience has proved they are so dependable, so efficient, so economical.

General Motors 2-cycle Series 71 engines provide Diesel power at its best — *Diesel brawn without the bulk.*

Hear Henry J. Taylor on the air every MONDAY evening over the ABC Network, coast to coast.

Only GM Diesels provide all these advantages

- Smaller size, less weight per horsepower
- Two-cycle smoothness, power on every downstroke
- Quick starting, on its own fuel
- Unit injectors—no high-pressure fuel lines
- Rapid acceleration • Cleaner-burning
- Better high-altitude performance
- Easy accessibility

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up to 275 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS . . . Up to 800 H.P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

Old Viaduct Felled; New, Wide One Built

(Continued from preceding page)

reach a maximum height of 22 feet; they average 16 inches in thickness. Forms were built of ¾-inch plywood, backed with 2 x 6 vertical studs on 12-inch centers and double 2 x 8 wales spaced from 1½ to 2½ feet apart. Medco form ties were employed.

Quantities and Personnel

The major items in the substructure contract included the following:

Unclassified excavation	18,334 cu. yds.
Bridge excavation	16,412 cu. yds.
Borrow	15,093 cu. yds.
Reinforced-concrete pavement	19,097 sq. yds.
Bridge concrete	7,255 cu. yds.
Reinforcing steel	560 tons

Frazier-Davis Construction Co. was represented on the bridge project by E. H. Kersting, Superintendent, and W. W. Rowen, Assistant Superintendent. For Blount Brothers, C. C. Davis was Project Manager. Virginia Bridge was represented by F. J. Peifer, Assistant Erection Superintendent. For the Alabama State Highway Department, Randolph Rowe is Resident Engineer. The Department is headed by Ward W. McFarland, State Highway Director. Marvin Taylor is Construction Engineer.

Tractor Excavator With 5-Foot Bucket

A versatile 5-cubic-foot excavator for Ford and Ferguson tractors has been developed by Pippin Construction Equipment Co., Inc., White River Junction, Vt. This combination digger and loader is tractor-powered and hydraulically operated.

Trenching may be done with a 24-inch-wide backhoe bucket or a 22-inch-wide shovel-front attachment. The unit digs to a depth of 7 feet below grade and will dig plumb trenches on sidehills with grades up to 15 degrees. The regular bucket type of shovel may be reversed from normal front position to a backhoe position for certain operations. Buckets on the Pippin excavator elevate to a position 15 feet above grade and have a lateral swing of 110 degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 156.

Shoring and Column Clamps

A 20-page catalog on shores and column clamps has been prepared by Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind. Rooshors, the literature points out, replace standard 4 x 4 shoring methods for savings, safety, and speed in modern building construction. They are adjustable—within their range of three sizes—from 8 to 14 feet, 7 to 13 feet, and 5 to 9 feet. The catalog illustrates them, lists sizes and parts, highlights their automatic locking feature, and points out that they are adaptable for exterior beams, walls, interior beams, and high-story shoring.

The Roos column clamps are available in the hinged-bar and single-bar type to fit any column within a range of adjustment of the several sizes. They automatically square the column and have no parts to come loose, the folder points out. The catalog indicates available sizes, features, and applications for a wide variety of column cross sections.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

Jahn Trailer Division News

The Jahn Trailer Division of Pressed Steel Car Co., Inc., formerly the C. R. Jahn Co., has moved its sales and executive offices from Savanna, Ill., to 6 N. Michigan Ave., Chicago. Its manufacturing operations will soon be transferred to the Mount Vernon, Ill., plant of Pressed Steel Car Co., Inc.

John G. Watson has been appointed Assistant Sales Manager of the division. He was formerly Assistant Eastern District Manager of the Lima-Hamilton Corp., Shovel and Crane Division.

Rust-Prevention Catalog

A new catalog issued by Rust-Oleum Corp., Evanston, Ill., suggests how to use rust-preventive finishes on machinery and implements, heat-resistant and chemical-resistant coatings, floor coatings, etc. It treats some 36 different kinds of rust-prevention services and applications.

The catalog features an extensive showing of color chips. Seventy colors are plainly designated and reproduced. The specification descriptions indicate resistant qualities, drying time, thinner requirements, and methods of application.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 88.

ALABAMA PIPE COMPANY

General Sales Offices

ANNISTON, ALABAMA

Takes pride in announcing the resumption of pressure pipe manufacture at its recently completed modern plant located at Anniston, Alabama. This plant produces Super deLavaud cast iron pipe, centrifugally, in modern long lengths.

Inquiries addressed to our nearest sales offices will be appreciated

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26	27	28	29	30	31	32	33	34	35	36	37	110	111	112	113	114	115	116	117	118	119	120	121
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Water Main Moved To Dip Under Canal

Relocation of 54-Inch Line Is Part of Chain of Rocks Project On Mississippi; New Pipe Is Prestressed

✦ BEFORE construction could start on the 8.4-mile canal for the Chain of Rocks improvement on the Mississippi River, an existing 54-inch water main was first relocated. Owned by the East St. Louis & Interurban Water Co., the concrete pipeline crossed the right-of-way for the new canal on a very flat angle at a point about 3½ miles above the new lock now being built. (See C. & E. M., Feb., 1949, pg. 23.) The lock is in Madison County, Ill., about 1 mile east of the river, opposite St. Louis.

The Chain of Rocks canal and locks are a Mississippi River improvement by the Corps of Engineers, U. S. Army, St. Louis District. The purpose of the canal and locks is to by-pass the Chain of Rocks reach in the river, which has always been troublesome to navigation, by providing a channel of dependable 9-foot depth.

The relocation of the 54-inch-ID water main was done by the River Construction Corp. of New York under a $550,790 low-bid contract to the Corps of Engineers. The same firm is also engaged in building the locks. It is composed of the Al Johnson Construction Co.; Spencer, White & Prentis, Inc.; Turner Construction Co.; Raymond Concrete Pile Co.; Winston Bros. Co.; and Morrison-Knudsen Co.—some of the country's largest contractors. The job took approximately 10 months.

City Water Main

Several existing utilities had to be moved because of the new canal, but the 54-inch water main was the largest. It runs from a pumping station on the left bank of the Mississippi to a standpipe in East St. Louis to supply the city with water through a gravity-feed system. The contract included 5,100 linear feet of new 54-inch pipe. In the relocation the skew crossing of the canal was eliminated. The new alignment has two sections of pipeline at right angles to each other, so as to cross the canal perpendicular to the banks. Where the water main crosses the canal, twin 54-inch lines were laid on 22-foot 6-inch centers.

The canal has a bottom width of 300 feet with 1 on 3 sideslopes, with a depth ranging from 15 to 43 feet below the existing ground surface. The average depth is about 35 feet. Levees parallel and adjacent to the canal are 20 to 29 feet in height above the natural ground. At the pipeline crossing the canal bottom is at elevation 378, while the tops of the levees are at elevation 439.5. Where the dual line dips under the canal, the pipe was laid in trenches to insure a 6-foot cover over the top of the main. A hole was excavated at the canal for a length of 400 feet x 125 feet wide and 50 feet deep.

Prestressed Pipe

The reinforced-concrete 54-inch-ID pipe was manufactured at the Chicago plant of the Preload Central Corp. of Kansas City, Mo. Its 3-inch shell is prestressed with high-tension wire for greater strength. The basket-weave design of the reinforcing provides longitudinal as well as circumferential compressive strength. Cast in 16-foot lengths, the pipe was delivered to the job by trucks, four or five trailers running every day. The pipe tested to 8,000-pound strength.

Excavation for the large cut at the canal and the trenches on either side was done by draglines. The trenches were dug deep enough to allow for 3 feet of cover over the top of the pipe. At the canal cut as the hole deepened, the draglines loaded the material into Athey track wagons pulled by Caterpillar D8 tractors.

Ground water presented a problem at once at the canal-crossing cut, after a 15-foot depth was reached with the digging. A Griffin wellpoint system was installed at four different levels on one side, and at three levels on the other. Altogether about 1,200 risers, 1½ inches x 24 feet, were hooked up to some 3,500 feet of 8-inch header line. As many as 13 Griffin 10-inch pumps with an approximate capacity of 70,000 gpm were kept in operation to unwater the big hole, so as to permit excavation and pipe setting in the dry. The elevations of the various-level header lines were 8 feet apart for economical and most efficient operation.

Laying the Main

Cranes laid the pipe on the job. Precise adjustment to the profile grade was attained with chain falls hung from the cable hook off the crane boom. Each joint was wedged and blocked up to grade. The 16-foot lengths have bell and spigot joints which were tightly fitted together with Flexlock

(*Concluded on next page, Col. 3*)

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OUT OF SAVINGS!

the FOOTE Kinetic mixer

UNUSUAL mixing principle means better coating of aggregate—less waste—faster output. Owners have reported savings as high as 50% per ton of asphalt.

Handles any mix—fully portable—turns out 3 cu. ft. in 30 seconds—built to give long service. Ask for Bulletin K-100.

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- Platform Lengths 18, 22 & 30 Ft.
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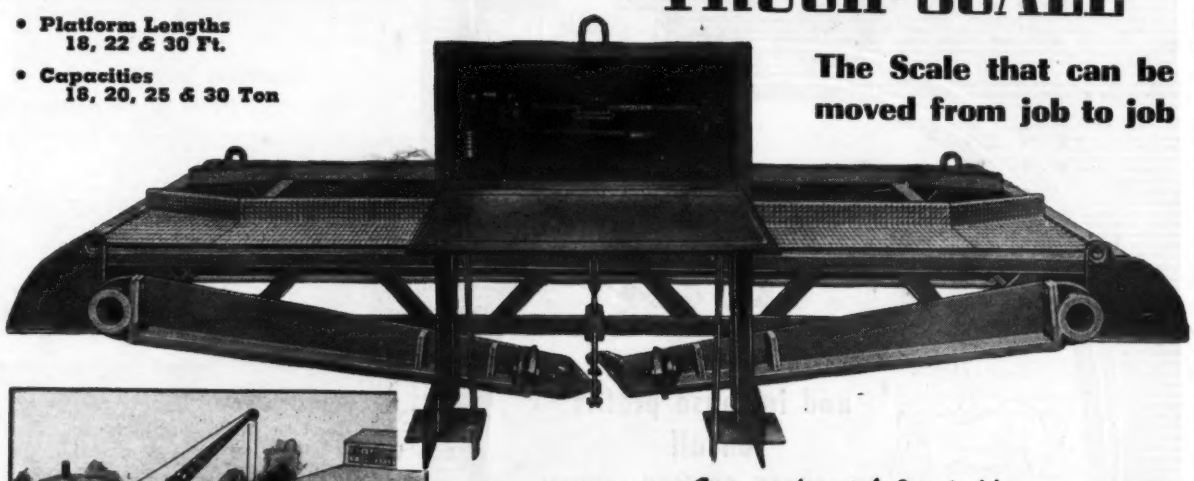
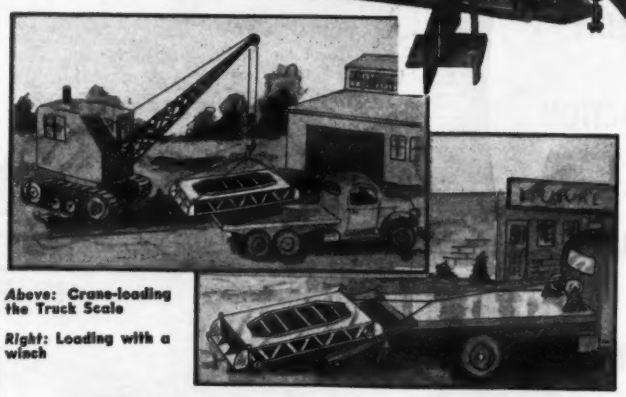
The Scale that can be moved from job to job





Above: Crane-loading the Truck Scale

Right: Loading with a winch

Accurate and Portable—two outstanding features which make the Thurman Portable Truck Scale, America's finest. 6 nuts release the side arms—the unit can be moved and readied in minutes.

Wide Steel Bases—hold scale firm—require no concrete footings. Easy-to-read baked enamel weighbeam with vital parts electroplated, against corrosion.

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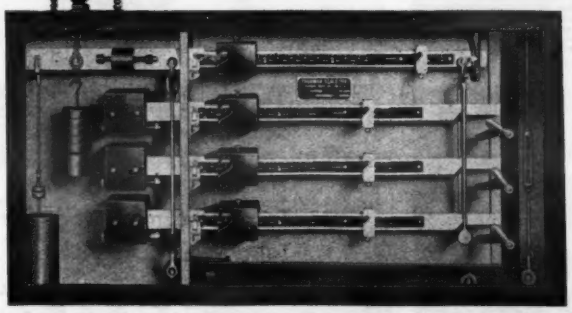

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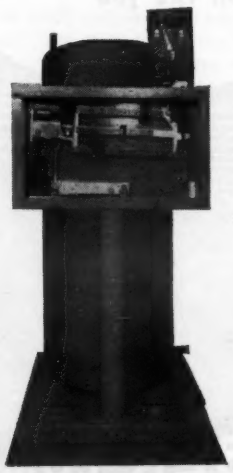

water SCALE

Designed to weigh all types of liquids. Engineered to meet your specifications. Calibrated in pounds and gallons. Supplied with sensitive electrical and mechanical indicators.

Information available on Thurman Wheelbarrow Scales, warehouse, utility and Pit scales. Write today.

THE THURMAN MACHINE CO.—Scale Division
156 North Fifth Street Columbus 15, Ohio

C. & E. M. Photo
A Lorain crane with a 60-foot boom lowers a section of concrete pipe into a trench during the River Construction Corp. water-main relocation job.

Water Main Moved

(*Continued from preceding page*)

continuous rubber gaskets slipped into copper sleeves. Both liquid and powdered asphalt was used to calk the joints. The inside of the pipe was treated with an application of Preload membrane bituminous seal coat.

To prevent seepage along the pipe where the line passes under the levee, hexagonal-shaped 12-gage corrugated-metal diaphragms were placed around the main at 32-foot intervals, or every two lengths. The diaphragms are 14 feet across the axis.

Laying two lengths of parallel pipe under the canal was a safety measure; in case anything went wrong in one line, the other would be available. Valves on both sides of the big ditch control the flow of water through the mains. The line under the canal was supported by a continuous concrete cradle, 6 feet 2 inches wide x 1 foot deep, with the sides extending up around the pipe for support.

Where the main crosses Chouteau Slough, a shallow body of water between the canal and the river, concrete-pile bents were erected to support the pipe. The bents are on 16-foot centers, and consist of 16-inch octagonal concrete piles, two to a bent on 3-foot 9-inch centers. The piles are 15 feet long, and are joined at the top by a concrete cap 6 feet long x 18 inches wide and 20 inches deep. Cradles and caps were poured on the job with ready-mix concrete supplied by Lybarger Concrete & Materials Co. of Granite City, Ill.

Quantities and Personnel

The major items in the contract for the relocation of the 54-inch concrete water line include the following:

Excavation	105,000 cu. yds.
Pipe, RC 54-inch ID	5,100 lin. ft.
Concrete in pipe cradle	160 cu. yds.
Concrete-pile bents	34
Antiseepage diaphragms	17
Removal of existing water main	3,200 lin. ft.

Personnel of River Construction Corp. on the Chain of Rocks project included F. B. Spencer, Manager; S. C. Doughty, Principal Engineer; R. J. Dunlap, Construction Manager; and Alex Jonsson, Superintendent.

For the Corps of Engineers, G. A. Allen is Resident Engineer. The St. Louis District is headed by Col. B. C. Snow, District Engineer. The Chain of Rocks improvement is under the general supervision of Brig. Gen. D. G. Shingler, Division Engineer.

C. & E. M. Photo
A 16-foot section of water pipe is adjusted in the trench by a chain fall suspended from the boom of a Lorain crane. The pipe is wedged and blocked to grade under each joint.

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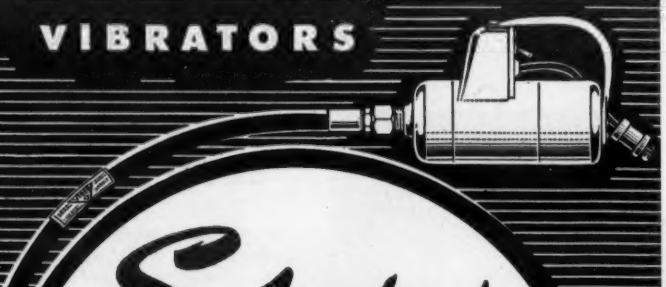

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INTERCHANGEABILITY
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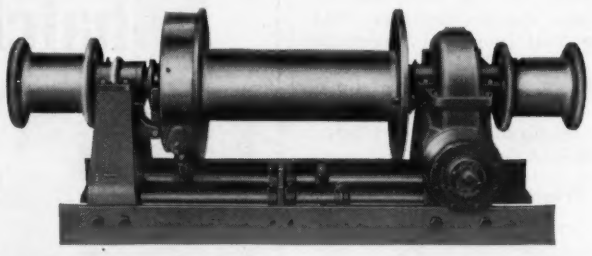
Tulsa Winches for all crawler tractors complete with transmission, line roller assembly and mounting brackets ready for installation.



To get the most work from your tractor or truck, install a Tulsa Winch. Available in 28 different models in capacities from 6,000 to 80,000 pounds, there is a Tulsa Winch for every construction job. Get in touch with your nearest Tulsa Winch distributor now or write direct to . . . . .

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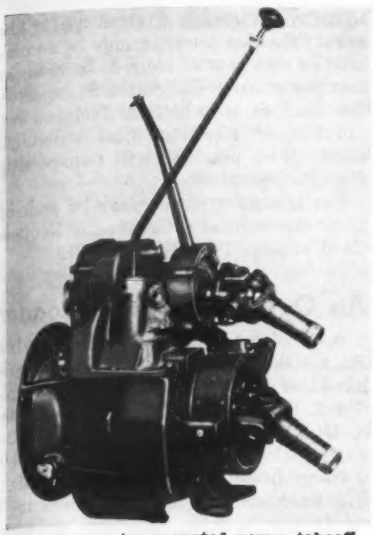


The Tangen top-mounted power takeoff operates at full efficiency whether the vehicle is moving or stationary. It is made to fit almost every make of truck.

New Power Takeoff For Standard Trucks

A top-mounted power takeoff said to eliminate the need for a conventional V-belt drive has been announced by Mobile Power, Inc., Box 997, Lansing, Mich. Known as the Tangen, the new unit is direct-connected to the vehicle engine, operating at full efficiency whether the vehicle is in motion or stationary. Speed is governed by the crankshaft speed without relation to transmission range. The takeoff delivers 98 per cent of the engine torque transmitted directly from the main drive gear in the transmission, according to the manufacturer.

The unit is easily installed and becomes an integral part of the transmission without affecting the driving mechanism. It is manufactured to fit almost every make of truck and, if desired, can be removed at any time. Applications suggested by Mobile Power include operating generators, pumps, air compressors, mobile cranes, sprayers, grinders, searchlight units, hoists, arc welders, winches, buzz saws, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 107.

Maintenance-Tool Bulletin

A 20-page bulletin issued by Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn., illustrates and describes new tools specially designed for removing and replacing costly parts without damage. It features the OTC pulling system — which utilizes the Grip-O-Matic pullers and Push-Pullers with various adapters and attachments—and pictures typical puller jobs on which these tools are used.

The company also announces the availability of heavy-duty adjustable wrenches designed to remove lock nuts and adjustable bearing nuts on full-floating truck axles as well as truck-front and trailer axles. Four of the wrenches adjust to fit hexagonal sizes from 2 to 4¼ inches and three to fit octagonal sizes from 3 to 5 inches.

Literature on these products may be obtained from the company, or by using the Request Card at page 16. Circle No. 20.

Gradall Division Transferred

Manufacture of the Warner & Swasey Co.'s Gradall has been transferred from the company's Cleveland plant to a plant in New Philadelphia, Ohio. The new plant, formerly occupied by American Sheet & Tin Plate, was in full operation by mid-August. About 125 men are employed under the direction of Fred W. Blaisdell, Production Manager. Cleveland employees formerly assigned to the Gradall Division were absorbed in Warner & Swasey's Machine Tool and Textile Divisions.

A separate Gradall plant, the company says, will permit more economical production and will simplify the planned doubling of 1951 production schedules. Gradall sales headquarters remain in Cleveland.

High-Strength Chain For Dragline, Shovel

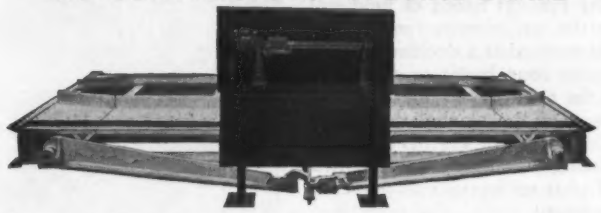
A new high-strength chain for power-shovel and dragline use is now produced by Baer Steel Products, Inc., Auburn, Wash. Cast of Baer's Fibraloy steel, originally developed to absorb the battering required of earth-moving-bucket castings, the chain is said to have a 150,000-psi tensile strength.

Extra strength allows longer wear within the working capacity of the chain and permits the use of 10 per cent lighter lengths when new, the company states. Toughness at high hardness levels provides the chain with shock and abrasion resistance, especially at subzero temperatures. Full-bodied links, seated on large bearing surfaces, provide a long wearing life, Baer says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site.
Capacities: 15-18-20-30 Ton—Write us for your nearest distributor

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All Lull Shoveloaders are powered with the LULL Precision-Built Hydraulic PUMP. The already famous LULL Precision-Built PUMP maintains a pressure of 1000 lbs. per sq. in. indefinitely without pressure or volume loss. The foaming, overheating, or backlashing of oil is practically eliminated in all LULL PUMPS.

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Now the operator of a Lull Super Sweeper never leaves his seat. Lull Power Hydraulic Controls at his finger-tips start or stop broom, regulate the speed of rotation, raise or lower broom . . . or set broom at any angle from 35° left to 35° right in a matter of seconds, independent of tractor motion. Lull Super Sweeper is the ideal for airports, streets, industrial plants, universities or institutions, parking lots or strip mining.

LULL STANDARD SWEEPERS with manual height and angle control available at low prices.

Hour after hour . . . month after month . . . rugged strong Lull Shoveloaders are digging . . . lifting . . . loading . . . transporting . . . scraping . . . and bulldozing faster and better . . . and at LOWER COST!

Operators have learned from long experience to depend on sturdy Shoveloader construction for continuous round the clock performance.

Value-packed with exclusive features, the Lull Shoveloader handles more jobs and costs less to own. Eight models to choose from with a wide variety of interchangeable attachments. Send in the coupon today and get the facts on the Shoveloader built to do your job.

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A Rapid Field Test Of Moisture Content

A rapid method for determining the moisture content of soil has been analyzed by Albert James Bonar in Research Report No. 9 published by the Texas Engineering Experiment Station. Conclusions reached in the report are that the alcohol method is rapid enough to meet the present needs of field soil engineers; the ten minutes required by the alcohol method is a decided advantage over the four hours or more required by the oven-drying method; and the accuracy of the alcohol method is comparable to that of the oven-drying method, being within the established criteria of plus or minus one per cent moisture content.

The author points out that the method is particularly suitable for use in the field, since the equipment for it can be easily transported. A very limited calculation is involved and a skilled operator is not required to perform the test. It is also brought out that though other agents for the removal of water from soil are available methyl alcohol fulfills the requirement and is economical to use. Forty to fifty tests may be performed with one gallon.

A copy of Research Report No. 9 may be obtained from the Texas Engineering Experiment Station, Agricultural & Mechanical College of Texas, College Station, Texas.

Automotive Diesel In the 152-Hp Class

A new supercharged automotive diesel engine developing 152 hp and a maximum torque of 370 pound-feet at 1,600 rpm has been announced by The Buda Co., Harvey, Ill., for operation in trucks and tractors carrying gross loads up to 52,000 pounds. The engine has a bore of 4¼ inches, a stroke of 5½ inches, and a piston displacement of 468.3 cubic inches. It is a 6-cylinder model, full diesel, of the solid-injection type.

The overall length of the unit from the flywheel housing to the front of the fan is 47 9/16 inches; the width at the widest point is 29½ inches. The unit weighs 1,418 pounds without electrical equipment and air compressor.

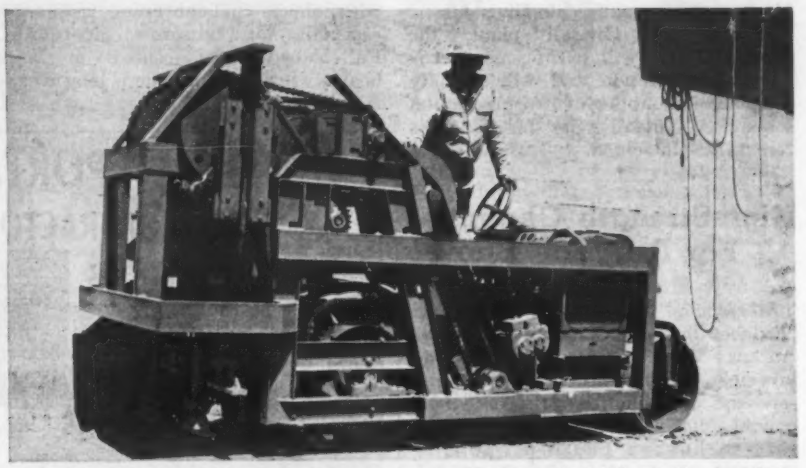
The crankshaft is counterbalanced with 12 counterweights and a torsional vibration dampener on the front end to provide smooth operation. A large number of the engine parts such as the manifold, the valve covers, brackets, and connections are made of aluminum alloy to give strength and keep weight down. The supercharger is of the positive-displacement type with helical cut gears for quiet operation. It is belt-driven with step-up gears built in for low drive belt speeds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 9.

Large Size Tamper That Gets In Close

A new large-size mechanical tamping machine has been designed for compacting backfill around concrete structures, in buildings, drainage ditches, and on other jobs where rolling is impractical. Developed by the Lewis-Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Texas, the new machine has four tampers driven on the principle of the old blacksmith triphammer. Each tamping foot is 3 inches wide x 13 inches long, giving the machine an effective tamping width of 52 inches.

The compactor is powered by a 25-hp gasoline engine and is controlled by a hand throttle, acting on the governor of the engine, which can be set to vary the speed of the tampers from approximately 30 to 150 blows per minute. This varies the total number of tamper blows from 120 to 600 per minute. The company points out that at minimum speed the tamping feet barely touch the ground, but as the speed is increased the intensity of the blow is increased to a maximum of approximately 7,000 pounds for each tamping foot. The travel of the machine is synchronized with the speed of the tampers to provide complete coverage of the area. Effective tamping may be accomplished at a rate of from 20 to 40 linear feet per minute. Called the Stompactor, the machine is to be manufactured in a number of sizes to meet individual needs. Each machine will require only a single operator.



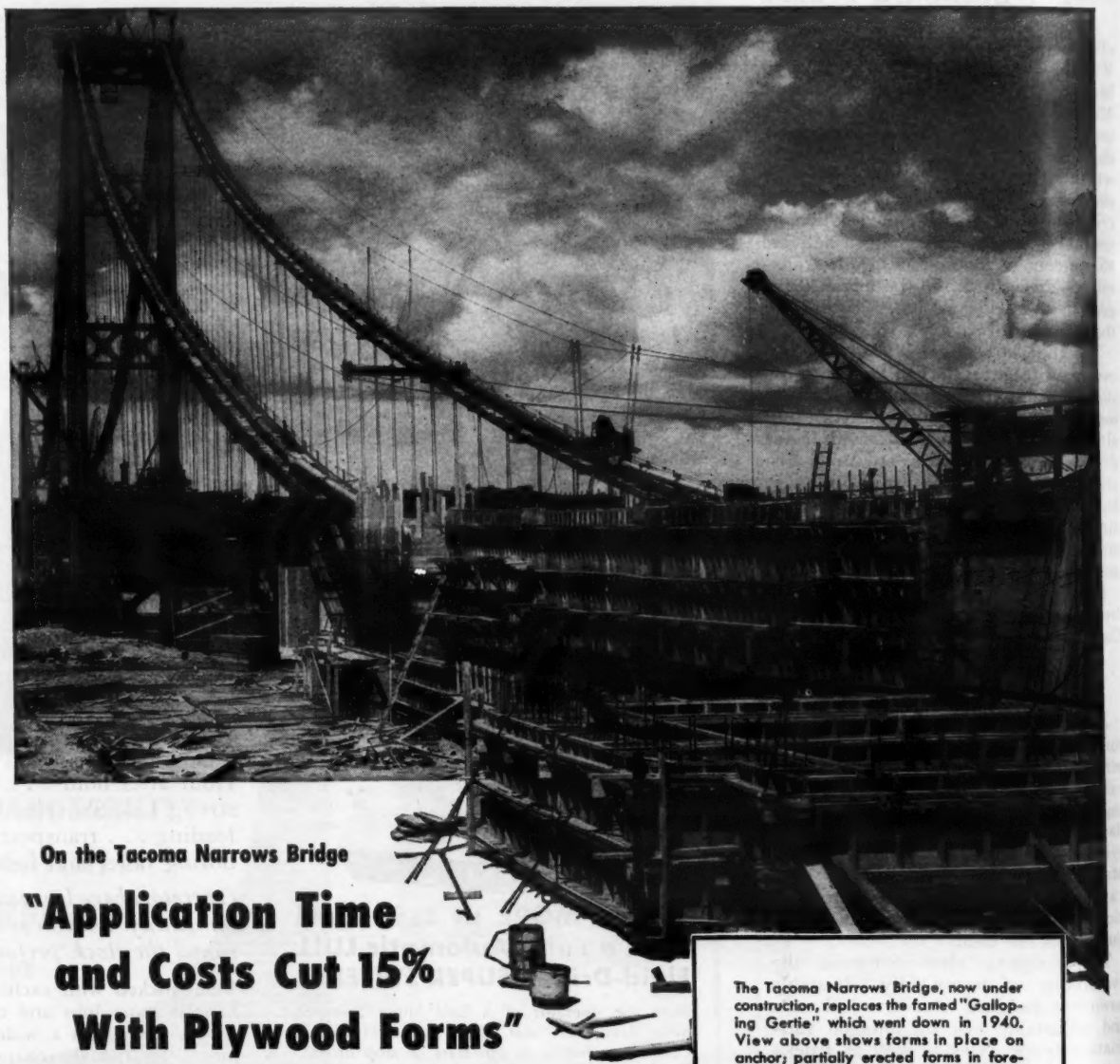
The Stompactor backfill tamping machine has 4 tampers and a total effective tamping width of 52 inches. It can deliver 120 to 600 blows a minute and develop a maximum blow intensity of 7,000 pounds for each foot.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

An Overhead Shovel Loader

A 4-color folder illustrating the 104 RockerShovel in sand and gravel work has been prepared by The Eimco Corp., 634 S. Fourth West St., Salt Lake City 8, Utah. The unit carries a 1¾ to 2-yard bucket for this work. Powered by a 48-hp diesel or a 30-hp electric motor, the RockerShovel can handle 6 to 8 yards per minute, the catalog says. Photos show it on a number of jobs.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 118.



On the Tacoma Narrows Bridge

"Application Time and Costs Cut 15% With Plywood Forms"

"ONLY PLYWOOD could produce the specified smooth, blemish-free concrete surfaces and also permit simplified, built-up form construction which saved 15 per cent on time and labor costs," says Earl Starbard, superintendent in charge of concrete work on the spectacular mile-long Tacoma Narrows Bridge.

On the job, almost a third of a million feet of Douglas fir plywood is being used for form work on the reinforced concrete road slabs and all exposed concrete on approach structures, viaduct and bents. Reason? "Smooth, easily-finished concrete; speed through ease of handling and large panel size; overall economy."

These comments are just one more example of why plywood is preferred for all types of concrete form work. Plan now to put these advantages to work for you. Write for two free booklets described at right.

The Tacoma Narrows Bridge, now under construction, replaces the famed "Galloping Gertie" which went down in 1940. View above shows forms in place on anchor; partially erected forms in foreground are for one of two toll house structures. Total length of project: 7,250'. The bridge itself: 5,979'. Main span: 2,800'. Constructed by Washington State Bridge Authority, Chas. E. Andrew, chairman and principal engineer. Dexter R. Smith, designing engineer. Concrete work: Woodworth and Co., Tacoma.

Douglas Fir

Plywood

AMERICA'S

Truck and Shop Hoist

The Lift-All, a new electric hoist designed for one-man operation in yards, shops, or garages, can be used on its own shop dolly or from any position on a truck bed. Developed by the Lift-All Equipment Co., 400 N. E. 97th, Portland, Oreg., the unit will handle weights up to 2,000 pounds.

Using push-button control, the operator is free to move about to guide the load. The boom, adjustable for height, swings completely around with its load. The Lift-All is powered by a specially designed 6-volt reversible motor. A 6-volt car battery is used on the dolly, and a truck battery supplies power when the hoist is truck-mounted.

For safety, the mechanical unit is completely housed in a metal cover at the base of the mast. The drum is equipped with a 40-foot length of ¼-inch 6-strand steel cable.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 29.

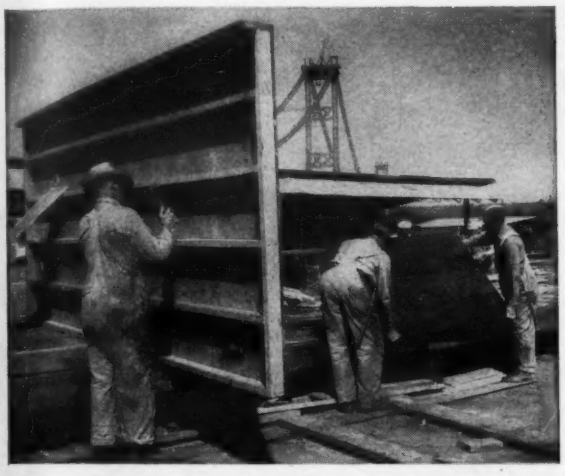
The Lift-All electric hoist can be used on its own shop dolly or from a truck bed. It will handle weights up to 2,000 pounds.

Adjustable Clamps For Foundation Work

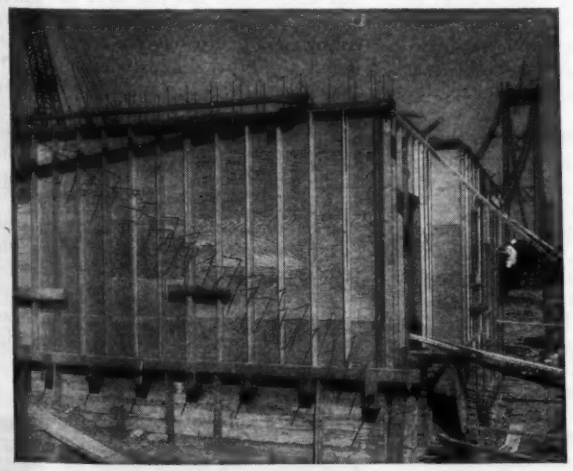
New adjustable steel clamps for setting up wood forms for curb, curb and gutter, and battered curb are now also adapted to setting up wood forms for building foundations, according to an announcement by the Pacific Engineering Sales Co., 215 W. 5th St., Los Angeles 13, Calif. Comprised of stake and crosspiece, this Pacific-Boult clamp is adjustable to widths from 4 to 8 inches, or heights up to 24 inches, and for batter from vertical to any angle. Standard steel stakes are used to prevent the forms from kicking out at the bottom. No special or patented spreaders or wall ties are required.

A new adjustable crossbar can be used with the regular stakes to set up any building foundation as much as 36 inches in height and 10 inches in width. The forms are held rigidly in place and need no additional bracing except in extremely soft ground conditions. No tools are required to adjust the clamps, because a locking lever, part of each clamp, holds the forms to line, grade, and shape. The face form is supported without stakes and can be removed without jarring or disturbing the fresh concrete, according to the manufacturer.

Further information may be obtained from the company, or by using the Request Card at page 16. Circle No. 67.



Form erection time was speeded by pre-building plywood form sections for anchors, approach structures and viaduct. Inner form faces were built in usual manner; steel reinforcing was then installed and built-up plywood forms were crane-erected in position. For anchor, ¾" Exterior Concrete Form Douglas fir plywood was nailed across 2"x 6" studs, 16" on center, backed by double wales 24" to 30", on center. Due to decreased concrete pressure, wale spacing was increased toward the top.



Form construction on the approaches and toll houses is similar to that on anchors, except 2" x 4" studding is used. Toll houses are each about 40' x 20' and two and a half stories high. Concrete anchor weighs 22,000 tons, is 30' deep, 80' wide and 120' long.

Large, Light, Strong Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, write: Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm".

BUSIEST BUILDING MATERIAL

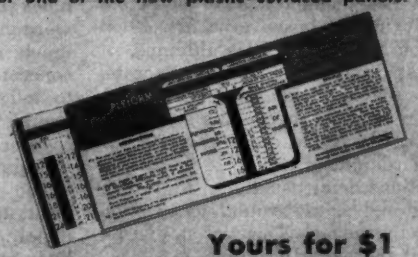
For Smooth, Fin-Free Concrete Surfaces...

PLYFORM

Concrete Form Panels

GENUINE DOUGLAS FIR PLYWOOD
PLYFORM
CONCRETE FORM PANEL
INTERIOR-TYPE GRADE B-B
D.F.P.A. INSPECTED

Smooth, fin-free surfaces . . . ease of handling . . . strength, rigidity, tightness . . . superior nail holding qualities . . . cost-cutting re-use factors—these are primary advantages of PlyForm. Highly moisture-resistant glues used in PlyForm panels permit multiple re-use (as many as 10 to 15 are not unusual). For the greatest possible panel re-use, however, specify Exterior-type Concrete Form grade of Douglas fir plywood—bonded with completely waterproof phenolic resin adhesive. For special architectural concrete, requiring the finest possible finish, the architect or contractor may specify Exterior-type or Interior-type Douglas fir plywood in grades having "A" face veneer—or one of the new plastic-surfaced panels.



Yours for $1

New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON (Good in USA only)

Please send me ..... Keely Calculators. I enclose $1.00 each to cover costs.

Name.....

Address.....

City.....Zone....State.....

Tandem Disk Harrow

Increased efficiency and mobility mark the new lift-type tandem disk harrow developed by Harry Ferguson, Inc., 3639 E. Milwaukee Ave., Detroit 11, Mich. This unit features a hydraulic control system that permits effective use in small areas, the company says; in corners; around trees, fences, and other obstructions; and in sandy, mucky, or wet soil. The implement may be attached to a tractor without the use of tools.

The harrows come in 7 and 8-foot sizes with both round and cutaway disks 16 and 18 inches in diameter. Independent flotation of each gang and independent angling between front and rear gangs is said to provide unusual flexibility. Bumper attachments are available for the outer end of each rear-gang assembly to prevent snagging the disk blades on trees or fence posts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 136.

Welding-Equipment Folder

To provide up-to-date operating data on its 1950 line of welding equipment, the Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., has issued a handy pocket-size equipment folder. It gives full design specifications for EutecTorch No. 1, used for light and general work, and for EutecTorch No. 2, for heavier work. It lists distinctive features of these torches and their uses. Both torches are available with cutting attachments.

EutecArc, a double-duty ac arc-welding machine which can handle a variety of work, is also covered in this folder. Its features are described, and all necessary operating information is provided. The folder lists additional accessories for gas and arc welding.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 148.

Manages New Hyster Store

C. E. Houston is Manager of the new retail store the Hyster Co. has opened in Peoria, Ill. A staff of 12 people assist him in supervising sales of lift trucks, Straddle Trucks, Turret Trucks, mobile cranes, and auxiliary attachments in a territory comprising most of Nebraska, all of Iowa, and northern Illinois.

The Rice Stadium playing field in the making—a Caterpillar No. 12 motor grader in the foreground dresses slopes as D8's and Carryalls work on excavation.

Surveyors check points for a concrete pour as a Northwest dragline and Caterpillar motor grader finish up the last of the dirt work in the 24-foot-deep hole.

A truck mixer delivers stadium concrete to the hopper of a Rex 160 Pumpcrete machine.

Carpenters get a pour ready by installing the 6-inch Pumpcrete delivery line.

Football Stadium Is Pushed for Completion

Quicksand and Water Fail to Slow Brown & Root as Rice Alumni Build South's Most Modern Football Site

✦ At 2:30 p. m. on September 30, the Rice Institute football team meets Santa Clara in Houston, Texas. The game is scheduled to be held in the newest, most modern stadium in the south. When the kickoff comes, it had better be made in that stadium — or never will so many Rice alumni have had faces so red.

Certain Rice alumni who are now successful promised to build a $2,000,000 stadium from scratch in 9 months' time. The playing-field bowl was the biggest, deepest excavation Houston had seen for years . . . and the builders hit quicksand and ground water. The 70,000-capacity stands called for concrete work which rivaled that in Houston's new Shamrock Hotel.

There are a few other items, too. Reinforced-concrete decks set so there won't be posts in anybody's way. A paved parking area to take care of all the cars. The most modern press-box facilities in anybody's football stadium, including foot warmers to keep Bill Stern's feet from getting cold.

"His feet won't get cold. The job'll be done in time for the game," says George Brown, Executive Vice President of Brown & Root, Inc., contractor. You get the idea that he's right, too, for Brown is the Chairman of the Rice Board of Trustees, and he also happens to be the contractor. According to Brown, the job is being done at cost. No profit is involved.

The southern crew tackled one of Houston's toughest construction projects with the same energy that Rice, on September 30, will tackle Santa Clara.

Designed for 70,000

Rice Institute's new stadium is designed to seat 70,000 people. In the future, when and if the ends of the bowl are closed, the site will accommodate 100,000 or more.

Milton McGinty and Lloyd & Morgan were the general architects and designers. Associated with them were Walter P. Moore, Structural Engineer; and Lockwood & Andrews, Civil and Mechanical Engineers. It is a big job to find anybody in the design or construction key spots who isn't a Rice alumnus.

The stadium is reinforced concrete. To get a playing field at the right elevation in relation to the seating structure, it was necessary to dig nearly 200,000 cubic yards out of a hole 24 feet deep. Excavations don't usually go that deep in Houston, because ground water is too close to the surface. This was an exception, but the water was not.

A Big Dirt Job

Knowing that this would be the case, the management of Brown & Root decided to start with tractor equipment and see what would happen from there. Three Tournapulls with an HD-19 Allis-Chalmers snatch-cat started the parade. There were also seven 8-yard LeTourneau Carryalls behind Caterpillar D8 and International TD-18 tractors.

These machines started at the top of the natural ground and began picking up loads of good clay. That was at elevation 55 or 56, referred to sea level. For a time the material dug about as well as anybody could wish. The access ramps got steeper and steeper as the excavation went down, and then at elevation 34 they found quicksand.

There it lay, a layer from 5 to 17 feet thick. Officially it was called "water bearing" sand, but to many a man who had worked with quicksand, the jelly-like characteristics were more than familiar.

Practically everybody agreed that the way to handle it was to cut through with something and put in a core wall. That would seal off the water from the outside and let them get at the big block in the center of the cut. Plans were made to dewater the formation as much as possible and then build a concrete core wall. There is little use to tell how that was done because it wouldn't work. When a trench excavator moved in to dig the sand, it wouldn't hold up.

The dewatering system was then built up to its maximum size. Approximately 1,500 linear feet of main header line, four pumps, and enough Moretrench wellpoints to reach across the dewatering site at 4-foot centers were used. The wellpoints went down through the sand, and the pumps went to work.

The sand dried up slowly; more slowly than anyone believed possible.

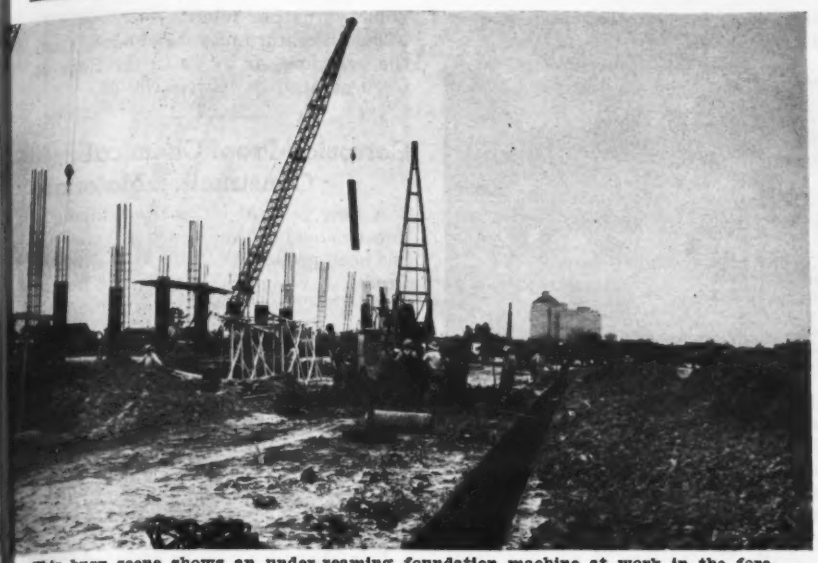
When it had dried enough to pick up in a dragline bucket, two machines moved in to cut through the sand stratum from above. A 2½-yard P&H and a 1-yard Northwest, working from a firm footing on top of the natural ground, cut through the quicksand to the solid clay underneath.

Moving in quickly behind these machines came the scrapers with heaping loads of tight, plastic clay soil previously excavated above that level. As the scrapers dropped their loads, an International TD-24 pushed the dirt out ahead and got the first lift started to seal off the sand. The first lift was followed quickly by others, all tamped down tight by sheepsfoot rollers. The machines stayed up with the draglines and followed all around the stadium perimeter. When they had finished, there was a thick dike of clay averaging 15 feet deep which sealed off the sand from the outside.

Wellpoints then dewatered the sand. Scrapers went back in and worked the remaining material out to an elevation of approximately plus 30. Normal sand lay under the quicksand, and soon the machines were back in good digging.

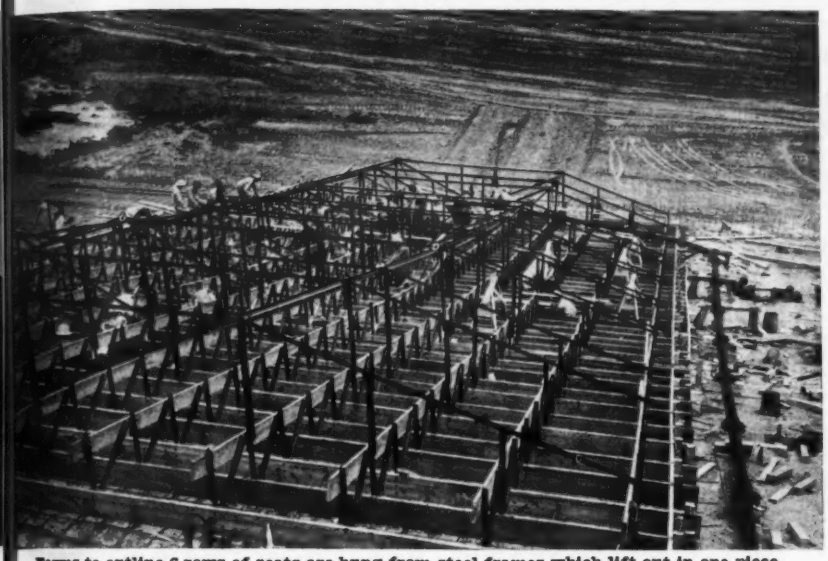
(*Continued on next page*)

C. & E. M. Photo
Technician E. W. Taylor tests air entrainment in the stadium concrete mix. Approximately 3 per cent was the goal.



This busy scene shows an under-reaming foundation machine at work in the foreground, a Speedcrane stripping forms, and backfilling.

Framed by the cabs and booms of two Manitowoc Speedcranes, a steel column form for the stadium clears steel reinforcement as it is stripped.



Forms to outline 6 rows of seats are hung from steel frames which lift out in one piece.

C. & E. M. Photos

The concrete crew handles the flow from the Pumpcrete line.

This Month

C. J. Rollo, Brown & Root's General Superintendent, pushed the clay core so fast once it got started that the sand was never permitted to run in. F. C. Kuich, Project Superintendent, is also an old hand at these problems, having whipped one or two with Utah Construction Co. Both Kuich and Rollo agreed that this was one of the worst they had found for years.

A permanent system of wellpoints, with drains which lead to sumps in the bottom of the field, will keep the surface water away in the future. When the drain system is operating, electric motors will drive dewatering pumps automatically whenever the ground water reaches a certain level in the concrete sumps.

The finished grade was covered with 2 feet of rich black topsoil and peat, and sown in Bermuda. The grass was planted by June 1, and everybody hoped that it would be well established by game time the last day of this month.

A neat quantity of 140,000 cubic yards of earthwork was scheduled, but by the time all the extra material had been rehandled fighting the sand, the quantity ran well over 200,000 cubic yards.

Architectural Concrete

Construction in the stadium proper called for a sizable architectural-concrete layout. Much of the concrete work is exposed, and forming methods were the best. One wall 300 feet long at the highest elevation along the stadium is so straight that even a trained field man's eye can't pick up the least bit of deflection.

The graded earth slopes above the playing field are covered with a minimum of 5 inches of reinforced-concrete slab, shaped to take redwood seats which were later installed. A rather unusual method was used here to set each 46-foot section up for a pour.

The forms to outline six rows of seats were suspended from a structural-steel framework made of 1½-inch steel angle iron. Each section of the framework had a set of lifting hooks, and could be handled by a small crane. Seven of these structural frameworks poured the 42 rows of seats from top to bottom.

Small jacks reached from the bottom timber screed to the ground to level the assembly and support it the right distance from the ground. The sections could be picked up and moved rapidly, and one set of the forms was expected to do the job. Richmond anchors to hold the seat brackets are embedded in the concrete.

Wall forms were made of lumber, with plywood facing. A large central carpenter yard had four power saws of various types, and the panels were cut to size and assembled there. Each panel had a single chamfer around the edge, so the finished concrete simulates the appearance of building blocks. Wall forms were tied together by Superior form ties, and the pours were also braced to the vertical columns.

Vertical column forms were either steel shells or wood panels, depending on the shape. Some of the largest under-reamed spread footings ever made in Texas were installed here. They measure 13 feet across at the bottom. The holes were drilled by rotary rigs, under-reamed by special tools for that purpose, and concrete was placed to the ground surface. On many of the 30-inch columns, the steel forms which were used in the Houston Expressway structures 2 years ago were re-used here. Square columns were

(*Concluded on next page*)

Finishers smooth the fresh concrete.

Anyway, that's how the job looked from the 50-yard seats which Brown & Root built on top of the carpenter shop for laymen quarterbacks.

Stadium Completion Pushed for This Month

(Continued from preceding page)

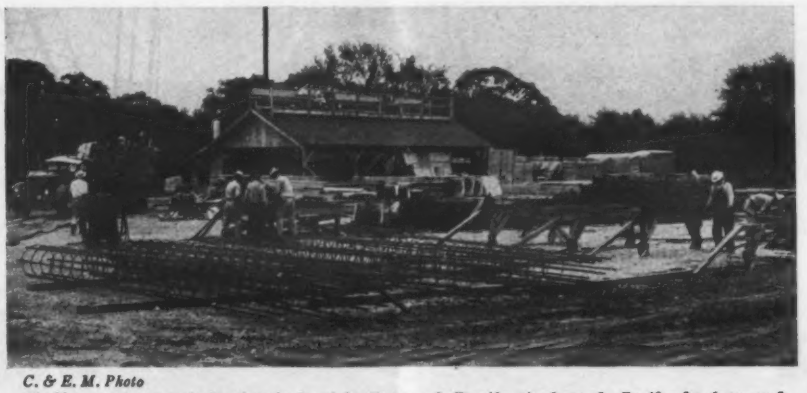
formed by wood panels. All column forms were handled by two Manitowoc cranes, and the column pours were also handled by these machines.

Deck forms consisted of steel boxes shaped to mold part of the floor beams. The main lateral beams were supported on wooden form panels which rested in turn on a series of Symons shores. These same patented shores supported all of the steel floor forms.

With the exception of that in columns, concrete was handled by a Rex 160 Pumpcrete machine and a 6-inch delivery line. It was delivered in truck mixers by W. D. Haden Co., and sent to the pouring point through the Pumpcrete line. Approximately 3 per cent of air was entrained in the mix.

Because of the clay ground condition, curing with water was impossible. Lambco clear concrete curing solution solved that problem.

The work has been coming along well on schedule, and an unusually dry spring in southern Texas helped progress considerably. Contractor officials felt sure when this job was visited, that given any kind of future break with weather, the starting whistle on September 30 would see two great football teams playing in the newest stadium in the south.



C. & E. M. Photo
Stadium column reinforcing is bent in Brown & Root's steel yard. In the background is the carpenter shop with its observation platform.

Pencil for Drafting

A drafting pencil designed to hold all standard makes of drawing-lead refills, and featuring a new press-button release, is manufactured by A. W. Faber, Inc., 41 Dickerson St., Newark 4, N. J. To extend the point, you press your thumb on a button release which enables the lead to be adjusted by an upward or downward movement of the pencil. When, the button is released, a precision collet holds the lead in a locked position. The Castell peneil is of plastic and metal construction.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 92.

Catalog on Trenching Unit

A 12-page catalog describing and illustrating the Model 310 Trenchliner is available from Parsons Co., Newton, Iowa, a subsidiary of the Koehring Co., Milwaukee 16, Wis. The unit digs 17 feet deep and 1½ to 6 feet wide in a range of 16 to 21 cutting widths.

The catalog illustrates and discusses the trencher's features: the shiftable digging boom which provides off-set digging for close-quarter operation; the power-shift conveyor which moves completely through the machine in less than one minute for controlled discharge; the automatic safety clutch to protect machinery from shock loads; and the unit-constructed main frame and oscillating three-point suspension for even weight distribution and uniform ground pressure. The bulletin also points out that the Trenchliner is equipped with 45 digging feeds ranging from 8 inches to 15½ feet, moving from 1½ to 3½ cubic yards per minute.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 40.

Corrosion-Proof Chemical Construction Materials

A new general bulletin describing a line of chemical construction materials has been prepared by the Atlas Mineral Products Co., 42 Walnut St., Mertztown, Pa. These products include corrosion-proof cements, brick sheathings, protective coatings, floors, brick and tile and plastic as well as natural and synthetic rubber corrosion-proof linings.

The 8-page bulletin gives a general description of the products, their chemical properties, their physical characteristics, and their specifications. Estimating data for the products are also offered.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 71.

SAFE MOVE
FOR YOUR COSTLY EQUIPMENT
SMART MOVE
GET TO THE NEXT JOB WITHOUT LOST TIME

with JAHN Heavy Duty TRAILERS

WHETHER your load weighs five tons or a hundred, you can depend on Jahn Trailers for safe and economical transportation to the next profitable job. They're famous for the rugged construction that means strength and stamina under the toughest conditions. From Jahn Tilt Trailers for your light equipment to big, sturdy tandem or multiple axle units for your heavyweight loads, there's a size and model to suit your needs. Investigate Jahn Trailers first—see your Jahn distributor today.

JAHN TRAILER DIVISION OF PRESSED STEEL CAR COMPANY, INC.
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THERE'S A JAHN TRAILER FOR EVERY HAULING NEED

Tandem Axle Trailers

Single Axle Tilt Trailers

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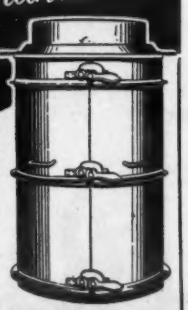
THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.
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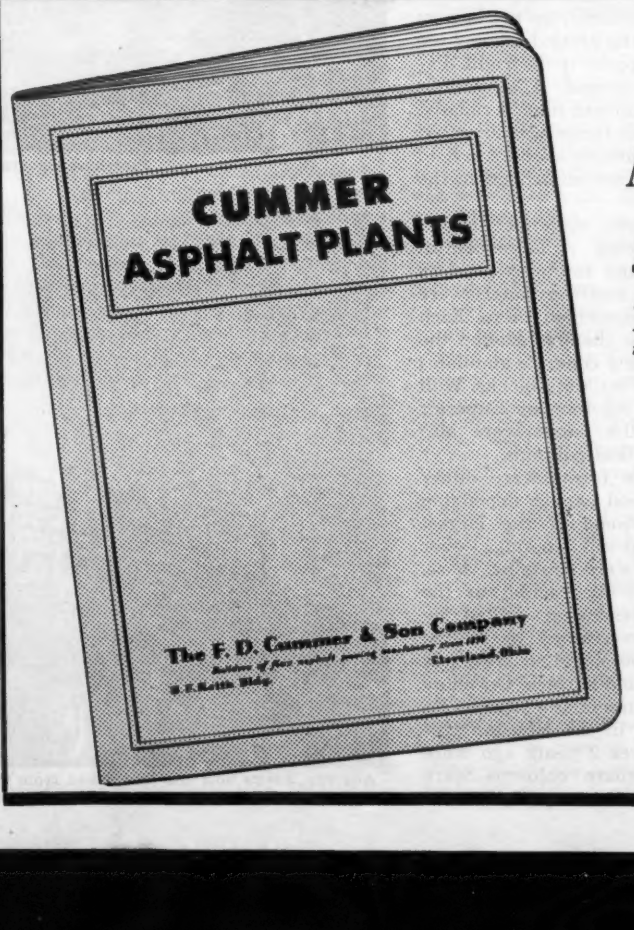

New!

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Asphalt Plant Data Book

Every paving contractor will want the new Cummer Asphalt Plant Data Book. It's complete. It's fully illustrated. It's free.

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Feeders—Storage Bins—Pumps—Timers
Cummer Asphalt Plants—sizes from 25 to 100 Tons (drying and mixing units) available

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Builders of fine asphalt plants
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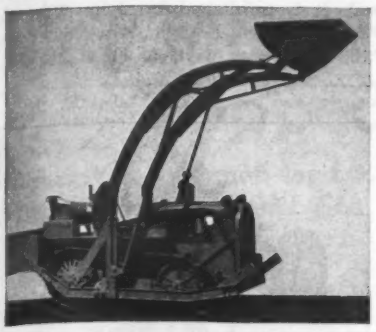


For the Ustrac crawler tractor—a new ½-cubic-yard front-end loader convertible to bulldozer.

A Front-End Loader

A ⅓-cubic-yard-capacity front-end loader, convertible to bulldozer, has been announced by the Tractor Division of Federal Machine & Welder Co., Warren, Ohio. It mounts on the Ustrac crawler-type tractor, which has 20.4 drawbar horsepower. The company points out that the Ustrac is only 37 inches wide and features four forward speeds and four reverse. The loader and bulldozer arms are operated by fingertip hydraulic controls.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 38.

New Truck Engine

A new 195 GKA valve-in-head engine has been adopted by The Four Wheel Drive Auto Co., Clintonville, Wis., as standard equipment for its Model HA truck. Rated at 125 maximum brake horsepower as compared to 105 in the previous standard engine, the 195 GKA has a torque of 245 pound-feet as compared to 237 in the previous standard. The added power and torque are said to provide greater speed and hauling ability, and to permit peak truck performance at fewer revolutions per minute, thus reducing engine wear.

The new Model HA Waukesha engine incorporates modern automotive design in its lubrication, ignition, valve mechanism, and cooling system. The drop-forged alloy-steel crankshaft is counterbalanced, both statically and dynamically, to a tolerance of 2 ounce inches. The valve-in-head engine has a piston displacement of 320 cubic inches with a 4⅛-inch bore and 4-inch stroke. Engines in FWD's complete line of four and six-wheel-drive trucks range from 97 maximum bhp in the recently announced Model LD to 275 maximum bhp in the M Series.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 54.

Hard-Facing Applications

New literature on the features of Rexarc, Rex-A-Lite, and Rex-Tung hard-facing and manganese rods for oxyacetylene and electric-arc applications has been prepared by The Sight Feed Generator Co., West Alexandria, Ohio. Included are descriptions of the various rods with recommended uses for each. The folder also treats the company's series of tungsten-carbide tubes and peas. Technical data on the running of hard-facing electrodes and some hints about welding on a manganese base are also given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 116.

Changes at Atlas Mineral

The Atlas Mineral Products Co., Mertztown, Pa., announces the following personnel changes: Richard A. Weppner is Sales Engineer for corrosion-resistant chemical construction materials in Delaware, Maryland, Virginia, and parts of West Virginia and New Jersey. Philip E. Berens has been shifted from the Detroit territory to eastern Pennsylvania, western New York, and parts of New Jersey as Sales Representative. William A. Streaker moves from the Engineering Department into the field as Sales Engineer in the lower peninsula of Michigan, eastern Indiana, and Lucas County in Ohio.

Before the Blast

A 10-minute film called "Before the Blast", outlining the proper methods for handling commercial high explosives, has been released by The Aetna Casualty & Surety Co., Hartford, Conn. Produced in full color, it illustrates basic safety rules for the transportation, storage, and use of commercial high explosives. Standard procedures for both large and small blasting operations are demonstrated in the film which pictures the dynamiting of stumps as well as hillsides.

"Before the Blast" may be obtained for showing through local Aetna agents or from the company's Public Education Department at Hartford, Conn.

Wind Twirls Warning Sign

A warning sign that rotates demands to be seen. That's the argument presented in a new 4-page folder describing Roto-Signals for use in road construction or maintenance. They trap air on their concave sides and twirl around, the catalog explains; they can be read whether moving fast or slow. Since they are printed on eight sides, front and back of the four vanes, there are no dead spots.

The literature, prepared by Roto-Signals, Inc., of Brecksville, Ohio, outlines the other features of these warning devices, illustrates their use, and lists specifications and some of the wordings. Other wordings can be made up.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

The Original and Only

"More Power Puller"

A compact, light weight hand-operated tool for heavy duty use, will cut operation cost, both time and labor. Unexcelled for construction use, moving machinery, handling equipment, rigging, pulling stumps, laying pipe lines and many other uses. Ask your local Dealer for demonstration.

Equipped with 20, 30 & 40 ft. of cable
List price $27.75 to $33.80

THE WYETH-SCOTT CO.
Newark, Ohio

B.F.Goodrich

Double nylon shock shield lengthens tire life

THE tires in this picture have been in daily quarry service for the Tyrone Rock Products Company of Tyrone, Georgia, for more than two years. And it's estimated that they are good for at least two more!

Four trucks such as that shown, haul 8-ton loads of granite to the crusher, travelling over sharp-edged rock. Tire service has been more than satisfactory.

The tread of the tires used, B. F. Goodrich Universals, is specially compounded to resist cutting. And the tread provides sure traction, forward or backward.

All B. F. Goodrich off-the-road tires have bruise protection in the form of a *double nylon shock shield* . . . layers of nylon cord built between the tread and body plies. Under impact, the strong, elastic nylon shields the cord body, distributes impacts and strains.

Only B. F. Goodrich gives you the added protection of the patented nylon shock shield; only B. F. Goodrich gives the added savings of (1) greater average mileage (2) less danger of tread separation (3) greater bruise resistance (4) more recappable tires.

There's a specially designed type and tread design for every need. See the B. F. Goodrich retailer. And specify B. F. Goodrich tires on new equipment. You can get nylon shock shield protection at no extra cost. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

With a power-controlled B-Line Fill Sloper attachment, a motor-grader operator can stay well away from the soft edge of a fill which finishing shoulders and slopes.

Finishes Shoulders While Grading Fill

The B-Line Fill Sloper attachment for Caterpillar No. 12 motor graders is designed to put the finishing touch on road jobs. Developed by Central Construction Co., Indianola, Iowa, it finishes shoulder lines and inside slopes while grading the fill. The unit is easily installed and removed, and is accurately controlled from the operator's platform, the company says.

The attachment slides onto the end of the Caterpillar No. 12 moldboard, and is held in place by a pin which drops into the first regular offset notch on the slide rail of the moldboard. Power control is by means of a hydraulic pump mounted on the grader frame and driven by one of the regular mechanical control shafts. The sloper wing is 5 feet long and uses a standard 5-foot cutting edge. It is ordinarily used in a trailing position and will drift material as needed for accurate finishing of fill slope, according to the manufacturer. It can also be used as an extension for cutting high banks which are out of reach of the moldboard.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 90.

Goodall Promotes Marshall

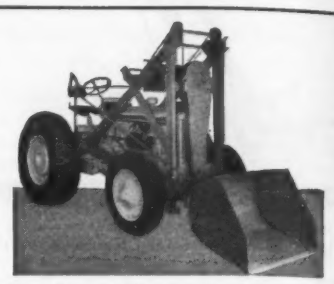
O. C. Jacobs retired on June 15 as Manager of the Pittsburgh branch of the Goodall Rubber Co., after 28 years of service with the company. Edward LeB. Marshall, who has been with Goodall in Philadelphia for several years, succeeds Mr. Jacobs.

Applied Sedimentation

A new book on the variability, strength, and processes of sediments has been written for civil engineers and geologists to help each understand the other's problems and cooperate more effectively. Its 35 articles prepared by specialists in the two fields deal with beach erosion, soil testing, seepage-control measures, navigation channels, dune sands, irrigation canals, and embankment stability—to pick a few topics at random.

All types of earth materials are considered in the book: (1) recent or slightly consolidated sediments; (2) ancient or maturely consolidated sediments; and (3) residual soils or soils weathered in place. The nature of the sediment and the processes which affect it are thoroughly treated. In addition, each article includes a selected bibliography as a guide for further study.

"Applied Sedimentation" was edited by Parker D. Trask of the California Department of Public Works and was prepared under the direction of the Committee on Symposium on Sedimentation, Division of Geology and Geography of the National Research Council. It is published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., and costs $5.00.



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THE NEW
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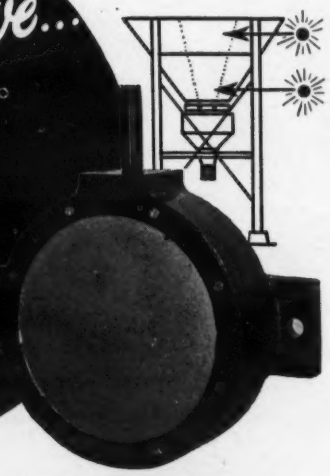

The longest-lived, most sensitive, trouble-free, low cost bin-level signal ever devised. For every make and type of bin —— and practically every material. One unit operates at top of bin, other at bottom. Long wearing, pressure-sensitive diaphragm actuates micro-switch to turn on signal. Extra heavy construction throughout. Order now from your BUTLER distributor.

IS YOUR PLANT EQUIPPED FOR FULL EFFICIENCY?

Bring your plant to top operation with these BUTLER accessories that expedite production.

AIR JETS. Quick acting, positive, durable.
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BIN GATES. Every type for every material. Rotary, clamshell, roller, radial and quadrant. Keep extra gates on hand.
AUTOMATIC TURNHEAD. Push-button in control. Automatically discharges to any station from one to eight.
CONCRETE HOPPERS. Saves valuable truck waiting-time. Sturdy, easily transported. Low cost repaid quickly.

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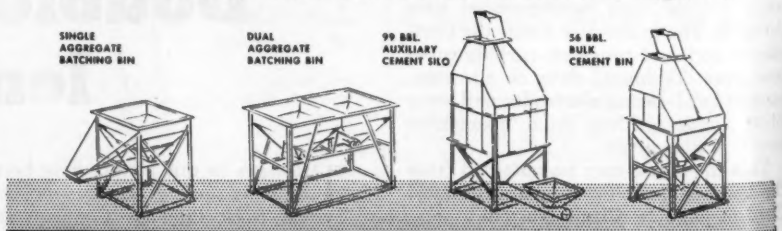
To solve any storage problem
Put the pieces together

GAR-BRO UNIT BATCH PLANTS

ASSEMBLE THE UNITS in any combination to meet your batching or storage requirements. They're engineered to handle aggregate and/or bulk cement and are easily re-arranged for use on the next job. Double-rail tracks on each unit lock together and carry the traveling weigh hopper equipped with multiple-beam scale. Weigh hopper is adjustable to discharge from either side or either end. Write for bulletin.

GAR-BRO MANUFACTURING CO., 2416 East 16th Street, Los Angeles 21



ASSEMBLE IN ANY COMBINATION

☆ Let Your Dollars Fight Polio ☆

Slag-Macadam Base Topped by Hot-Mix

Highway Is Widened for 4.74 Miles on U. S. Route 21 Near Parkersburg, W. Va.; Part Dual Roadway

✦ LAST year the State Road Commission of West Virginia improved a 4.74-mile stretch of U. S. 21 in Wood County north of Parkersburg, in the direction of Vienna and Williamstown, at a cost of $673,830. Low-bid contractor was Andersons', Inc., and West Virginia Black Rock Co. of Charleston and Parkersburg, West Va. Work started in January and was completed by the end of the year.

The original pavement had a 20-foot width, and consisted of a 4-inch plain-concrete base on which a brick surface was laid. The brick in turn was covered with black-top 3 inches thick which had become rough and uneven through heavy use. About 40 per cent of this old pavement was removed from the southerly half of the job because of its poor condition. It was replaced with a macadam base course which also widened the original pavement to 32 feet. Asphaltic concrete was then laid over the base for the full new width.

At the upper end of the project, the existing pavement was in satisfactory shape and so was left in place. A new 20-foot pavement, nearly 2 miles long, was added to form dual parallel roadways separated by a 13-foot grass mall. The construction is similar to the widening—black-top on macadam base. Actually the black-top is only 18 feet wide, but concrete curb and gutter work along the edges makes the width 20 feet between curbs. Curb and gutter was also laid along one side at the lower end of the job, and was bordered by a 4-foot 6-inch sidewalk of concrete.

Grading

Shelly Sands Co. of Marietta, Ohio, was subcontractor on the grading and drainage items, and also on the sidewalk and curb and gutter work. Two new culverts were built, and concrete pipe up to 72-inch diameter was installed. Most of the excavation, including the removal of the old pavement where necessary, was done with a Bay City ¾-yard shovel. The material was loaded into trucks averaging 4 yards a load, and was wasted in low spots along the road. A borrow pit less than a mile off the job provided suitable material for the fills. A couple of tractor-scraper units also saw service on some of the short hauls. An Allis-Chalmers motor grader shaped the final subgrade.

The concrete curb and gutter was built with a Dotmar mechanical curb and gutter paver. A face side was not part of the forms that were used, since the machine shaped the concrete as it was placed. Transit-mix concrete containing Darex air-entraining agent was supplied from Parkersburg.

The macadam base work consisted of the laying of two 5-inch courses of No. 1 slag, graded from 4 inches down, which was chinked with No. 13 slag, graded from ⅜ inch down. The gradation of the aggregate is shown in the following table:

Sieve Size	Per Cent Passing	
	No. 1	No. 13
4-inch	100	....
3½-inch	90-100	....
2½-inch	35-70	....
1-inch	0-15	....
½-inch	0-5	....
⅜-inch	....	100
No. 4	....	85-100
No. 100	....	10-30

Macadam Base

Slag aggregate for the macadam base was supplied by the Standard Slag Co. of Wierton, West Va., on the Ohio River. The material was loaded on barges and floated down to Parkersburg where it was unloaded by conveyors to the bank, and then by a ¾-yard shovel into trucks. Each course of the large size was laid by an Adnun Black Top Paver, and chinked with the

(*Concluded on next page*)

C. & E. M. Photo

A Littleford distributor on a Diamond T truck primes the new macadam base on U. S. 5 in West Virginia. RT-2 tar, at 0.7 gallon to the square yard, was used.

A Better Bond for Concrete Jobs

with Republic's Diamond ◇ Design Concrete Reinforcing Bars

● The reason: higher and more closely spaced lugs or deformations designed to exceed "Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"—ASTM Specification A-305-49, adopted June, 1949—the first standard specification to define surface deformations.

Thus you are assured of greatly improved bonding properties and reinforcement anchorage. You may be able to save steel—to cut bending and installation costs.

Republic's Diamond Design Concrete Reinforcing Bars are rolled from new billet steel only—at Cleveland, Buffalo, South Chicago and Gadsden. Check the table below for foot weights and new size designations. Write us for further data.

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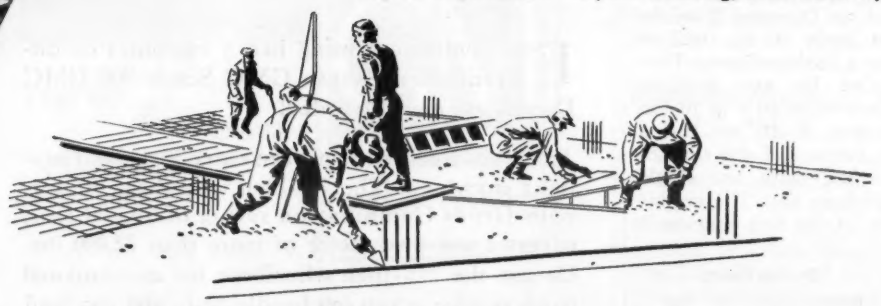

Size Number	Cross-Sectional Area, sq. in.	Nominal Diameter, in.	Foot Weight, lbs.
3	0.11	0.375	.376
4	0.20	0.500	.668
5	0.31	0.625	1.043
6	0.44	0.750	1.502
7	0.60	0.875	2.044
8	0.79	1.000	2.670
9	1.00	1.128	3.400
10	1.27	1.270	4.303
11	1.56	1.410	5.313

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PIPE LOCATOR
"The Greatest Improvement in Years"
MODEL 505

Consider these Features:
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All these and many more at a
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C. & R. M. Photo
Two Buffalo-Springfield rollers, a tandem and a 3-wheeler, roll hot-mix on the Andersons', Inc., road-widening contract.

Slag-Macadam Base Topped by Hot-Mix

(Continued from preceding page)

smaller slag put on by a Buckeye spreader. The fines were rolled into the larger-size slag by two Buffalo-Springfield 12-ton 3-wheel rollers. Drag brooms hooked to the rollers also helped to work in the small-size slag. The courses are dry-bound, with no water added.

When the top course was finished, it was primed with RT-2 tar applied at the rate of 0.7 gallon to the square yard by a Littleford 1,300-gallon distributor mounted on a Diamond T truck. Koppers tar was hauled 130 miles to the job from Follansbee, West Va., in an International 4,000-gallon trailer tank truck. It was transferred either to the distributor or to a 4,000-gallon storage tank kept on the project. The prime was put on in varying widths to suit conditions, for traffic was maintained on this heavily traveled road throughout the construction operations.

Asphaltic Surface

The macadam base was next covered with two courses of asphaltic concrete. The initial, or binder, course was laid at the rate of 120 pounds to the square yard, with the wearing or surface course weighing around 80 pounds to the square yard. When compacted, together they measure slightly less than 2 inches in thickness. The Standard Slag Co. also supplied the aggregate for the hot-mix, while the Ashland Oil & Refining Co. of Ashland, Ky., furnished the 85 to 100-penetration asphalt. The materials were mixed in the contractor's commercial asphalt plant located in south Parkersburg—a Hetherington-Berner 1-ton pugmill.

Weights of a typical 1-ton batch of binder and top follow:

	Binder	Top
Sand	300 lbs.	976 lbs.
Medium slag	850 lbs.	880 lbs.
Coarse slag	760 lbs.	....
Asphalt	90 lbs.	144 lbs.
Totals	2,000 lbs.	2,000 lbs.

The mix was hauled an average distance of 5 miles from the plant to the job in a fleet of six Diamond T trucks holding 7 tons each. It was laid in 10-foot lanes by a Barber-Greene Finisher, and rolled by two Buffalo-Springfield rollers—first an 8 to 10-ton tandem, and next a 10 to 12-ton 3-wheeler. An average of 450 tons of plant-mix was laid with the single machine in a 10-hour day. The gradation of the mix in the two courses is as follows:

Sieve Size	Per Cent Passing	
	Binder	Top
1-inch	100	....
¾-inch	93-100	....
½-inch	....	100
⅜-inch	25-75	93-100
No. 4	10-25	50-70
No. 8	....	30-50
No. 16	....	20-40
No. 50	0-8	7-20
No. 200	....	1-8
Bitumen	3-7	6-10

Quantities and Personnel

The major items in the road contract included the following:

Unclassified excavation	39,300 cu. yds.
Borrow	30,000 cu. yds.
Slag for macadam base course	19,000 cu. yds.
Tar prime	32,700 gals.
Asphaltic concrete	7,300 tons
Reinforced concrete pipe, 18 to 72-in.	2,400 lin. ft.
Concrete curb and gutter	25,650 lin. ft.
Concrete sidewalk	116,150 sq. ft.

An average force of 75 was employed on the project. Paul Grass was Superintendent on the black-top work for Andersons', Inc., and West Virginia Black Rock Co. For the State Road Commission of West Virginia, C. M. Murphy was Project Engineer, and Carol McCullough was Inspector. Ray Cavendish is Commissioner, and George W. McAlpin is State Construction Engineer.

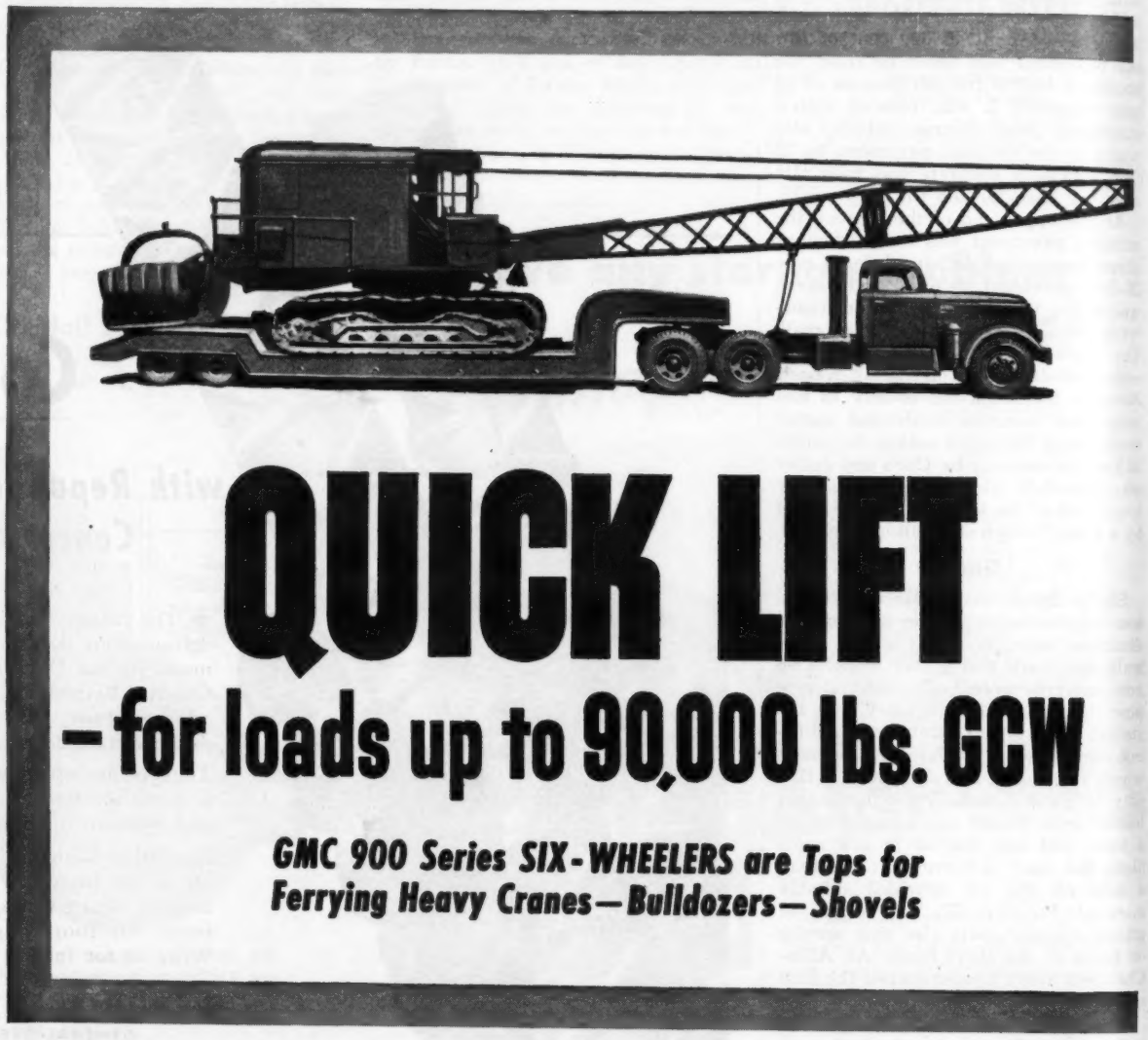
U. S. Will Get Its 1950 Roads, But Not Until 1966

Col. E. R. Needles, President of the American Road Builders' Association, reports that highway systems of the 48 states won't meet the demand of 1950 traffic until 1966 at the current rate of road-construction expenditures. It is important to remember, he adds, that the highway system which would have been adequate for 1950 will be inadequate for traffic needs at the time of its completion because of interim increases in traffic volumes, weights, and speeds. Even now these increases are doing much to invalidate all-out efforts to overcome deficiencies in state highway systems documented by a Congressional committee at $23,044,630,320.

Col. Needles points out that 16 years is the average time, and that some states will take much longer. Rhode Island, for example, will need 60 years at the current level of construction to build a highway system equal to her needs right now. Residents of only 21 states can expect to have their highway systems brought up to 1950's needs in 16 years or less ; in only seven of these states will it take less than 10 years to do the job.

Directs Goodyear Belt Sales

M. W. Sledge has been named to replace the late E. W. Stephens as Manager of the Belt Sales Department of Goodyear Tire & Rubber Co., Akron, Ohio. Formerly Assistant Manager, Sledge will direct all belt sales and will work closely with C. F. Smith, newly appointed Chief Project Engineer, on large conveyor-belt prospects.



QUICK LIFT
– for loads up to 90,000 lbs. GCW

GMC 900 Series SIX-WHEELERS are Tops for Ferrying Heavy Cranes—Bulldozers—Shovels

FOR contractors using heavy machines on different sites — these GMC Series 900 GMC Diesels are made to order!

These six-wheeled giants can move just about anything anywhere. The 197-inch wheelbase tractor, with Gross Combination rating of 90,000 lbs., covers a tow-load factor of more than 72,000 lbs. Or use the 215-inch wheelbase for conventional truck service — you can handle body and pay load up to 37,000 lbs.

Eight Rear Tires for Traction and Action

The four dual driving rear wheels mean traction — assure full control of the load. With the "heavy end" riding on eight tires, concern over delays from tire failure vanishes. And the same eight tires let you run this equipment over soft ground or sand — no more off-the-road headaches.

For covering distance—these heavyweights really move. With standard transmission equipment, they carry maximum loads easily at 35 mph. For working on grades, their Diesel power, 5-speed main transmission and 3-speed auxiliary provide a flexibility that is a revelation.

Diesel Power—with 2-Cycle Efficiency

Engines in these trucks are those famous GM 2-cycle Diesels — the same power plants that are revolutionizing the commercial hauling field by speeding up schedules and slashing fuel costs.

It's *power on every downstroke* that pays off with the 2-cycle job — and packs such a wallop in such a

Giant Socket Wrench

A special socket wrench with a 6-inch hexagon opening, the largest Proto socket ever built, has been announced by Plomb Tool Co., 2209 Santa Fe Ave., Los Angeles 54, Calif. It was designed for use with impact equipment by the road-maintenance crew of a large water and power utility. It has an outside diameter of 9¼ inches, a length of 8 inches, a drive size of 1½ inches, and a weight of 67 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 66.

Bulletin on Tunnel Liners

A 4-page bulletin describing tunnel liner plates has been offered by the Youngstown Steel Car Corp., Niles, Ohio. It points out that the company's engineering department is fully equipped to furnish estimates and engineering data for practically any type of liner plate, and that hydraulic and mechanical presses with complete punching, forming, welding, and shearing facilities are available for steel fabricating.

The catalog cites the following as features of Youngstown steel liner plates: Because of flanges at angles between the ends and sides, the plates are unusually stiff across the diagonal corners. Because of small triangular openings between the plates when assembled, ground conditions above plates can be checked before concreting. Openings are provided in all plates for grouting after concrete lining is poured. Openings at the corners of the plates make it possible to get back of the plates with bars to bring them into line for bolting. When loose sand or gravel is being mined, a special patented corner is provided to seal all openings and speed assembly.

When loads are too severe for liner plates alone, the bulletin recommends the use of plates in conjunction with structural sections, such as I-beams, curved to the same radii as the plates. The bulletin also offers a table of properties of the company's liner plates.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 68.

The Strait-Line hydraulic loader for Oliver Model 77 wheel tractors digs either at the back or at the front of the tractor, but dumps always in front. Increased traction on rear digging and special bucket design make possible good bank penetration.

Tractor Attachment Loads Front and Back

A new hydraulic tractor-loader has been developed which can dig at either the front or rear end of the tractor and dump always in front. The operator is free to select the digging end to fit the job, and can do any type of loading without turning the tractor. For this reason the unit is known as the Strait-Line hydraulic loader. According to the manufacturer, Maine Steel Inc., South Windham, Maine, the loader combines in one machine the features of an overhead and a conventional front-end loader.

The Strait-Line is for use exclusively on Oliver Model 77 wheel tractors and is available only through Oliver dealers. Rear digging, the company points out, adds weight to the rear wheels, increasing traction, and reduces weight on the front wheels for easier steering. Thus the new loader is said to combine in one machine four features: the high mobility of a wheel tractor, increased speed and reduced tractor wear because of straight-line operating, increased traction with rear-end digging, and easy steering that reduces operator fatigue.

Instead of having nearly vertical sides, the Push-Tilt bucket has long loading lips with sides sloping up to the bucket proper at an angle of about 30 degrees for easy bank penetration. The rear-end tilt is obtained by pushing the bottom of the bucket away from the tractor instead of pulling the top of the bucket toward the tractor. This action lifts the cutting edge 20 inches and thrusts it further into the bank after the tractor has penetrated to its limit and stopped.

On a level surface the Strait-Line is designed to lift a load of 4,100 pounds to a height of 8 feet in front and to swing 2,900 pounds over the top from rear to front. Bucket size is 9/16 yard with side boards to enlarge it to ⅝ yard. The combination can be driven from job to job at speeds up to 15 mph.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 48.

Machine-Mounted Meter Checks Slope and Grade

Your tractor, scraper, or grader operator can automatically control and check slopes and grade with a Slope-Meter mounted on his equipment, according to a new circular offered by The Slope Meter Co., of Mound, Minn. The meter may be mounted in any of a number of positions on almost any type of earth-moving equipment. The literature points out that it reduces time in cutting proper slopes, grades, and highway crowns, eliminates hand checking, and avoids a wavey slope surface.

This circular and a copy of the operating instructions may be obtained from the company, or by using the Request Card at page 16. Circle No. 98.

compact engine. The trim lines of the GMC's engine result from the Unit Injectors that eliminate bulky high pressure fuel systems with oil pumps, manifolds and distributors.

GMC's Make Friends of Your Drivers

Drivers are all for GMC Diesels. GMC's have Synchro-Mesh transmission as standard equipment. Only GMC's have the re-circulating ball-bearing steering gear—for easiest handling.

If you have a heavy hauling handicap—make a date with your GMC dealer at once. Let him show you the right GMC truck for you—and why, when all cost figures are in, GMC's are the *lowest cost transportation* you can buy.

GMC Truck & Coach Division of General Motors

Your key GM *to greater hauling profits*

GM
GENERAL MOTORS
DIESEL TRUCKS

GMC—THE RIGHT TRUCK FOR EVERY JOB

Whatever you're hauling—marble slabs or name plates, concrete or conduits, you'll find *the best truck* for it in the GMC line—most complete line of trucks in the world, built by the largest exclusive maker of commercial vehicles.

Ranging from ½ to 20 tons — with gasoline or Diesel power — GMC trucks are all *real* trucks — the *most economical transportation* money can buy!

New Truck-Mounted ½-Yard Shovel-Crane

The new Model HC-51 truck-mounted shovel-crane manufactured by Link-Belt Speeder Corp., Cedar Rapids, Iowa, features fully hydraulic Speed-o-Matic controls, a front-drum reversing mechanism for power-control load lowering, and a heavy-duty carrier specifically designed for truck-crane operation. The new model converts to all conventional front-end attachments. It has 10 forward speeds and 2 reverse, with a road speed of 37 mph. A walking-beam support on the rear axles permits rear wheels to follow uneven terrain and equalize road bumps.

The company points out that all clutches but one on the 51 are completely interchangeable and all shifts and gears are set in antifriction bearings. The unit is provided with a pin-connected hinge-type folding boom for road travel and an easily removed rear outrigger for shovel and trench-hoe operation over the rear. This mobile unit has a lifting capacity of 12½ tons and a shovel bucket capacity of ½ yard.

The HC-51 truck-mounted shovel-crane has a lifting capacity of 12½ tons and a bucket capacity of ½ yard. It features fully hydraulic Speed-o-Matic controls.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.

Bulletin on Roll Crushers

Its new line of redesigned and improved twin and triple roll crushers is covered in a 16-page bulletin prepared by Pioneer Engineering Works, 1515 Central Ave., Minneapolis, Minn. The bulletin describes and illustrates applications of the roll crusher in the gravel, rock, and construction industries, and contains tables and information to enable selection of the proper type and size of crusher for the job.

Dimension and foundation data are included, and a special chart shows the expectable percentages of the various sizes of material in the product of a roll crusher. The center spread consists of a full cutaway to show how the crushers are built and to point out their features.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 42.

Aluminum Ladder Scaffolds

The time-saving feature of lightweight aluminum ladder scaffolds in assembling, disassembling, storing, and transporting is stressed in Bulletin PSS-20 issued by The Patent Scaffolding Co., Inc., 3821 Twelfth St., Long Island City 1, N. Y. These aluminum sectional ladder scaffolds are of the rolling type designed for overhead and sidewall work on painting, cleaning, repairing, and other maintenance jobs. They can be assembled in various heights and are available in spans of 6, 8, and 10 feet.

Their safety provisions are also outlined: sturdy cross-bracing together with rigid joint construction, which comes from slipping the upper frame over a sprocket in the lower section and securing it with a hinged pin on the Patent scaffolding. A spring-lock attachment secures horizontal members and diagonal braces quickly and safely, the folder points out. Interchangeable parts make it possible to erect one or more sections as the job requires.

This literature may be obtained from the company by requesting Bulletin PSS-20, or by using the Request Card at page 16. Circle No. 82.

ROE

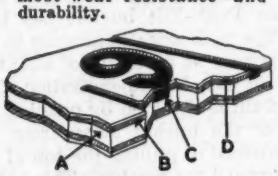
STEEL TAPES

are best for

CONTRACTORS...

the facts prove it!

FIRST AND FOREMOST, Roe Steel Tapes are extremely easy to read . . . and they go right on being clearly legible year after year. The black markings are permanently etched into the steel which is then nickelplated to provide a lustrous contrasting background. A transparent plastic overcoating is added for topmost wear resistance—and durability.



A—Steel tape
B—White nickel
C—Black etched markings
D—Plastic overcoat

Pictured here is the Roe Steel Tape #302 with polished chromeplated, sturdy welded steel case. Other Roe models feature cases in handsewn leather, and in metal-banded leather and leatherette. They have a reinforced rust resistant liner, precision winding drum, flush-folding handle, press button center and roller mouthpiece. All are available with 25, 50, 75 or 100-foot tapes; feet in inches and eighths, or in tenths and hundredths.

Get Roe Steel Tapes from your hardware dealer—or—write us giving his name and address.

JUSTUS ROE & SONS

Makers of fine steel tapes since 1876

PATCHOGUE NEW YORK

MOVING A SEA WALL

Shown here are a McKiernan-Terry E-2 Pile Extractor and a No. 6 Pile Hammer being used by the Esbary Foundation Co. on a sea wall in front of the new Sun-N-Sea Hotel, Miami Beach, Florida.

Pulling up a sea wall and moving it to the water's edge to make room for beach cabins was the job faced by the Esbary Foundation Co. They did it quickly and easily with two pieces of McKiernan-Terry equipment. Before the E-2 Double-Acting Extractor pulled up each pile of sheeting, the No. 6 Double-Acting Pile Hammer drove down the adjacent pile to break the bond.

No matter what your job, you can always find a powerful, dependable safe McKiernan-Terry hammer or extractor to meet your specific requirements. Double-Acting Hammers are available in ten standard sizes, Single-Acting Hammers in five and Double-Acting Extractors in two.

McKIERNAN-TERRY VERSATILITY

Coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment are among the many other important products of McKiernan-Terry engineering and manufacturing skill that are performing important service to industry, the railroads and our government. .

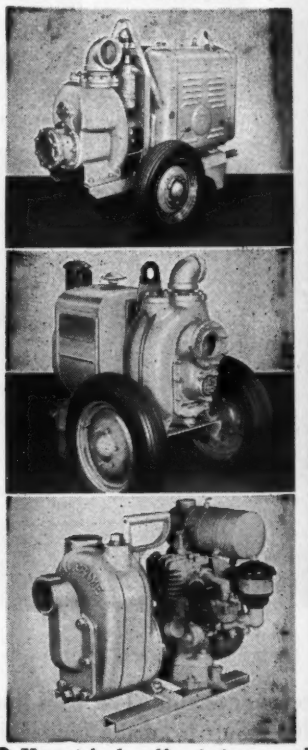
McKIERNAN-TERRY CORPORATION, Manufacturing Engineers, 19 Park Row, New York 7, N. Y.

McKiernan-Terry PILE HAMMERS AND EXTRACTORS

PUMP DESIGN At it's Best

CMC DUAL PRIME

THE LAST WORD IN PUMP DEPENDABILITY



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● Non-clogging, open thrash type impeller handles solids up to ¼ intake size.

● CMC DUAL-PRIME pumps give top performance and maximum dependability even under the most adverse conditions.

Write today for latest illustrated catalog. CMC DUAL PRIME pumps are available in sizes from 1½" to 10"—capacities from 3000 to 200,000 gallons per hour.

CONSTRUCTION MACHINERY COMPANIES WATERLOO, IOWA

Convention Calendar

October 5-6—SASHO Meeting
Annual Meeting, Southeastern Association of State Highway Officials, Seelbach Hotel, Louisville, Ky. D. H. Bray, State Highway Engineer, Kentucky Department of Highways, Frankfort, Ky.

October 8-11—Purchasing Institute
Annual Conference, National Institute of Governmental Purchasing, Hotel Schroeder, Milwaukee, Wis. Albert H. Hall, Executive Director, 730 Jackson Place, N.W., Washington 6, D. C.

October 11-14—ASCE Meeting
Fall Meeting, American Society of Civil Engineers, Congress Hotel, Chicago, Ill. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

October 15-18—Public Works Congress
The 1950 Congress and Annual Equipment Show, American Public Works Association, Hotel New Yorker, Ninth Regiment Armory, New York N.Y. D. F. Herrick, Executive Director, 1313 E. 60th St., Chicago 37, Ill.

October 16-20—Safety Congress
National Safety Congress and Exposition, National Safety Council, Stevens, Congress, Morrison, and LaSalle Hotels, Chicago, Ill. R. L. Forney, General Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

October 24-26—Concrete Institute
Regional Meeting, American Concrete Institute, Mayflower Hotel, Washington, D. C. Harvey Whipple, Secretary-Treasurer, 18263 W. McNichols Road, Detroit 19, Mich.

November 12-30—Brazil Road Show
Road Show, Brazil National Highway Department and Associacao Rodoviaria do Brasil, Rio de Janeiro, Brazil. Ing. Jose Maria Carre, Delegado Executivo, Associacao Rodoviaria do Brasil, Caixa Postal 4351, Rio de Janeiro, Brazil.

December 4-7—AASHO Meeting
Annual Meeting, American Association of State Highway Officials, McCallister and Columbus Hotels, Miami, Fla. Hal. H. Hale, Executive Secretary, 917 National Press Bldg., Washington 4, D. C.

Dec. 10-17—Pan American Highway Congress
Fifth Pan American Highway Congress, Lima, Peru. International Road Federation, 550 Washington Bldg., Washington 5, D. C.

Jan. 9-12, 1951—Highway Research Board
Annual Meeting, Highway Research Board of the National Research Council, National Academy of Sciences Bldg., Washington, D. C. Roy W. Crum, Director, 2101 Constitution Ave., Washington 25, D. C.

March 12-14, 1951—ARBA Meeting
Annual Meeting, American Road Builders' Association, Shroeder Hotel, Milwaukee, Wis. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

Insulating Values of Glass

A new 36-page booklet entitled "PC Foamglas, the Long Life Insulation for Commercial, Industrial, and Public Buildings" has been released by Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh 22, Pa. It contains the complete story on normal-temperature—50 to 150-degrees F—applications of Foamglas.

The booklet offers information on the installation of Foamglas in ground floors; as a wall lining and for free-standing interior walls; and as a ceiling insulation. Technical data, facts about accessory materials, and a description of the new line of trowel finishes that can be applied directly to Foamglas are given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 110.

Paton Is Director of Engg.

Clyde R. Paton has been appointed Director of Engineering for Willys-Overland Motors, Inc., Toledo, Ohio. The company recently accepted $22,291,330.40 worth of Government orders for the Armed Forces.

Bulletin on Steel Forms

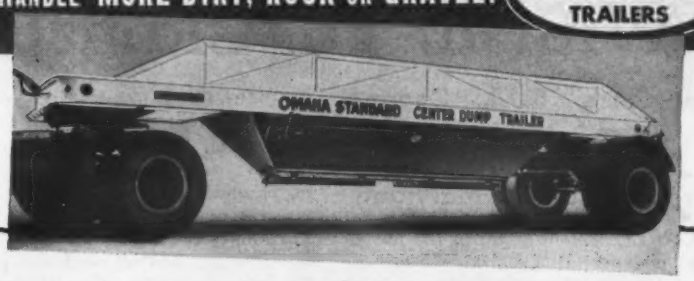
An 8-page bulletin on the application of steel forms in concrete construction has been prepared by Economy Forms Corp., P. O. Box 128, Des Moines 13, Iowa. It shows job installations of Economy forms for the construction of water-treatment plants, sewage plants, circular and rectangular tanks, bridges, culverts, box tunnels, and buildings.

The folder points out that these forms are adaptable to square, angular, or round corners, both inside and out. Standard forms and specially made ones are supplied on a rental basis, and the features of this contractor-supplier relationship are highlighted in the literature. Photographs show how the forms are erected and dismantled, how scaffold brackets are attached to them, and how individual plate units are removed for inspection or for placing concrete in high walls.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 64.

HERE'S A FASTER, EASIER, CHEAPER WAY TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD TRAILERS



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. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
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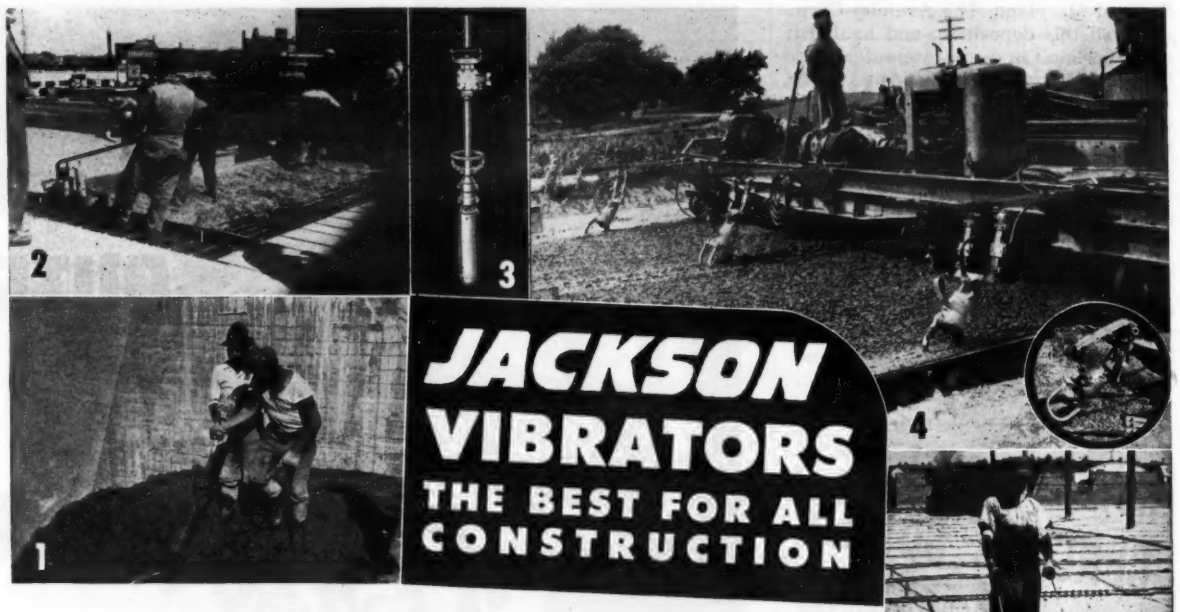

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3 **HEAVY DUTY GENERAL PURPOSE VIBRATOR:** For small dams, large sections or any job permitting entrance of a 4" diameter vibrator head.

4 **SIDE FORM VIBRATOR:** Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator. Saves better part of two men's labor. Will not penetrate through concrete to subgrade.

5 **VIBRATORY SOIL COMPACTOR:** Can be used to tremendous advantage in quickly obtaining specified densities in granular soils adjacent to structures, bridges, culverts, trenches, factory floors, earth fill dam construction and many other places. Propels itself.

6 **FLEXIBLE-SHAFT, ELECTRIC VIBRATOR:** 2½ HP motor. Operates from light socket, 115 volt, single phase AC or DC, with any length of shaft up to 28'. 8,000 to 10,000 VPM.

7 **HYDRAULIC VIBRATOR WITH 50 FT. REACH:** Powerful (7 HP), dependable and efficient. Reaches hard-to-get-at places with minimum moves of power unit.

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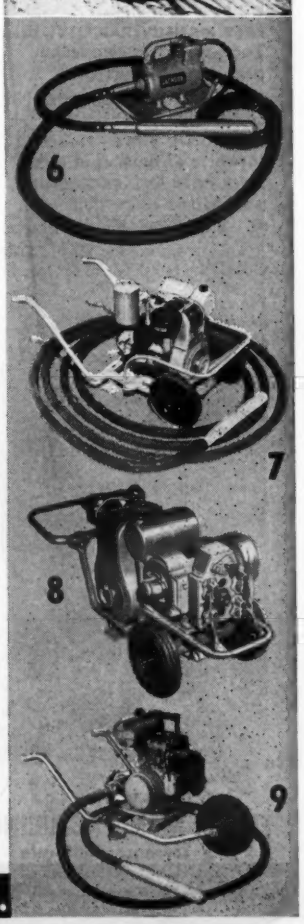
AND MANY OTHER VIBRATORS for every type of concrete placement. FOR SALE OR RENT at Jackson distributors. Write for free copy of our handy "POCKET GUIDE." Describes complete line.



ELECTRIC TAMPER & EQUIPMENT CO. • LUDINGTON, MICH.

Maintenance Dredging With 10-Yd. Clamshell

Providence, R. I., Channel Is Cleared to a Depth of 35 Feet by Arundel Corp.'s Dredge State of Maryland

+ A FULL 35-foot depth in the harbor of Providence, R. I., is once more assured to shipping with the completion of a 1,200,000-cubic-yard dredging contract by The Arundel Corp. of Baltimore, Md. The maintenance project of the New England Division, Corps of Engineers, U. S. Army, covers a 4-mile stretch in the Providence River at the head of Narragansett Bay. Not since 1941 has this section been dredged, and in the intervening years silting and shoaling reduced the navigable depth in places to from 30 to 34½ feet at mean low water.

With its 10-yard clamshell dredge State of Maryland, The Arundel Corp., removed this deposition, and hauled it away for spoil in deep waters down the bay. Dredging began in April, 1949, and was completed early this year. At the start, another clamshell dredge, the National, was used, but this was replaced after only a short time by the dredge State of Maryland, which finished the bulk of the excavation.

At Fox Point, the upper end of the project, the 35-foot depth is maintained over a width of 800 feet. At the ship turning basin, a short distance to the south, the channel widens to 1,600 feet. Seaward of the basin, a 600-foot channel is held to Sabin Point, at the south end of the contract.

As usual in contract dredging, a 2-foot overdepth of cut was allowed, but no payment was made if any material was removed below the 37-foot depth. Portions of the harbor were undisturbed by shoaling and showed the required 35 feet of water. Consequently the dredging process was often interrupted with moves to areas where the bottom was high. The usual procedure had the dredge making a cut 50 feet wide on a strip 400 to 500 feet long. It then moved over to an adjoining strip and made a parallel cut. The average depth of material removed was 3 to 4 feet.

The Dredge State of Maryland

The State of Maryland was acquired by The Arundel Corp. in 1934 at which time it was rebuilt and refitted throughout. Its wooden hull is 140 feet long x 44 feet wide x 16 feet deep, and draws 10 feet of water. The main deck housing is steel, and the upper deck is wood. It had a crew of 40 for working 3 shifts a day, 6 days a week, on this job. Part of the crew was quartered on the

(*Continued on next page*)

C. & E. M. Photo
What strikes the eye about Arundel's dredge, the State of Maryland, is its big boom, bucket, and supporting framework at the bow. Here it comes up with a bucketful in the harbor of Providence, R. I.

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Felker DI-MET
Standard Model

12" DIAMOND WHEEL (MAX. SIZE)
CUTS TO 3½" DEPTH
DOUBLE ENDED SPINDLE for right or left-hand operation.
EASY MANEUVERABILITY! Balanced. Turns, pivots in own length.
ONE MAN OPERATION.
TOWS TO AND FROM JOB! No loading, no hauling.
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TWO COOLANT PROVISIONS. Integral tank or hose connection.
POWERFUL 7½ h.p. gasoline engine.
Available from your DI-MET dealer. Get all the facts! Write for free literature!

For utmost wheel life in all concrete cutting applications DI-MET furnishes segmented type diamond wheels in two bond grades, STANDARD and SPECIAL.

FELKER MANUFACTURING CO.
Torrance, California
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OUTSTANDING
Performance!

All over the country dirt-moving men are singing the praises of Hendrix Dragline Buckets! Why . . .? Because they know they can get the most out of every job *with a Hendrix on the job!* Hendrix Buckets are large in capacity, yet light in weight, but also rugged in construction, providing swift, smooth, precision operation that gets more work done in less time. . . . All this spells *PERFORMANCE* . . . what you can expect and what you will get with a Hendrix Dragline Bucket!

THERE'S A TYPE AND SIZE
TO FIT EVERY DIGGING PURPOSE!

3/8 to 40
CUBIC YARDS

HENDRIX
Lightweight DRAGLINE BUCKETS

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HENDRIX MANUFACTURING CO., Inc.
MANSFIELD — LOUISIANA

C. & E. M. Photo
The 10-yard clamshell bucket of the dredge State of Maryland emptying its load into a steel dump scow.

dredge, while the rest lived in town.

The most striking part of the dredge is the big boom, bucket, and supporting framework at the bow. The 60-foot boom, weighing 25 tons, is tied back to an A and gallows frame having a height of 70 feet above the deck. The manganese 10-yard clamshell bucket is hoisted on two 1⅞-inch cables that go down to a pair of main hoist gear wheels, 14 feet in diameter. Each wheel has 300 feet of cable which permits the dredge to dig to a depth of 150 feet.

The big sheaves atop the gallows frame are for the wire ropes that pull up the two spuds on the dredge—located forward on the port and starboard sides. Each spud is made of hollow steel box plates 30 inches square x 67 feet in length, and weighs 18 tons. They are in the raised position except when the dredge is anchored for digging, when they are dropped into the harbor bottom.

Dredge Operations

The dredge moves not on its spuds but on lines out to anchors. From the stern a 1¼-inch cable, 2,000 feet long, runs out to a 2-ton anchor by which the dredge can move itself back and forth, with the assistance of 1-inch cables off the bow, also 2,000 feet in length. Two quarter lines are to anchors ahead, while two breast lines are off to the sides. The anchors are 1½ to 2 tons in size, and are shifted about by a tender when necessary. Cables to these lines are actuated by 8-foot-diameter wheels, two on each side of the dredge; the breast-line wheel is forward, with the quarter-line wheel directly behind it.

Near the stern, other anchor lines also go out on each side. On the port side the wire passes over the top of a gin post 6 feet high which provides deck clearance on the dredge. On the starboard side, the steel 2½-inch-diameter gin post is 25 feet high. With the cable going out to the anchor at this height, considerable clearance is provided along the starboard side of the dredge where the scows are always loaded. Three winding drums along this side of the deck enable the dump scows to be moved to any desired position during their loading.

While working in this relatively narrow river harbor, the dredge was kept on its course by ranges on the shore. These range posts were illuminated at night with Neon lights for easy visibility. Both head and cross ranges were provided. The dredge usually moved ahead in 9-foot advances when digging. The swing of the boom and bucket action were controlled by applying friction to the hoist lines.

C. & E. M. Photo
It's pea soup time in the galley of Arundel Corp.'s dredge State of Maryland—Cook Fred Fulford wields the ladle.

Steam Power

The dredge State of Maryland is powered by steam generated in a Scotch marine horizontal-type boiler, 16 feet in diameter x 11 feet long. It is fired

(*Concluded on next page*)

Here's a blueprint to LOW hauling costs!

DODGE trucks are "Job-Rated" for extra savings!

You can enjoy rock-bottom transportation costs and a brighter profit picture when you invest in a Dodge *"Job-Rated"* Truck.

You'll get a truck that's *"Job-Rated"* to provide peak performance at lowest possible cost on the toughest of assignments.

Its engine will be *"Job-Rated"* to give you power to spare—with maximum gas and oil economy. Every chassis unit—practically every nut and bolt—will also be *"Job-Rated."* That will cut your operating and upkeep costs.

Your Dodge dealer can help you bridge the gap between profits and losses by showing you a truck that's sized to your job. It will be *"Job-Rated"*! See him soon.

With all their extra value DODGE "Job-Rated" TRUCKS are priced with the lowest

Cut Costs! with ONAN portable ELECTRIC PLANTS

Take em Anywhere!

Use Electric Tools on Every Job

Carry, wheel, or truck 'em to any spot and plug in for all the electric power you need. Lightweight, Onan air-cooled electric plants supply power for electric drills, saws, planers, spades, tampers, lights . . . any electrical equipment. Lightweight A.C. models: 400 to 3,000 watts. D.C.: 750 to 5,000 watts. (Heavy-duty gasoline or Diesel plants to 75,000 watts.)

Write for Folder

D. W. ONAN & SONS INC.

•••0 Royalston Ave., Minneapolis 5, Minnesota

Maintenance Dredging With 10-Yd. Clamshell

(*Continued from preceding page*)

by three oil burners using bunker C fuel. The dredge holds 32,000 gallons, which amount lasts two weeks under constant working. Forward of the boiler is a Southwark 1,000-hp main steam engine, a dual unit with two cylinders operating at 135-pound steam pressure. Other steam engines on the dredge operate at the same pressure. Another boiler, a vertical type, serves as an auxiliary, but is not used for working operations on the dredge.

Steam also drives two turbine generators, G-E 12.5 and 10-kw units, for lighting, power for motors, etc. The larger is used constantly, while the smaller is a standby generator. Besides the main engine there is a dual engine at the stern for the stern anchor winding line; spud engines; scow-hauling engines; engines for the side anchor hoist lines; and capstan engines, fore and aft.

Practically all the dredged material was mud. Six bottom-dump scows were used for hauling the mud 7 miles down the bay to deep water between Prudence and Dyer Islands. A round trip from the dredge and back took about 7 hours. The Brooklyn, a 150-foot steam-driven tug, towed three of the scows at a time, while the other three were being loaded. Two of the scows held 1,500 yards, while the other four had a capacity of 1,000 yards. The tug averaged three trips a day, with the daily excavation running between 10,000 and 11,000 yards.

Other auxiliary craft included the tug Iris, a 40-foot diesel craft that handled men and material, as well as maneuvering the scows around at the dredge. Barges for water and oil rounded out the floating equipment.

Personnel

For The Arundel Corp. William Mullins was Superintendent. Captain Joseph Adams, with the dredge State of Maryland for the past 25 years, is Master of the dredge, and Erik Ericcson is Chief Engineer.

D. J. Salmon was Resident Engineer for the Corps of Engineers on the project. The New England Division is headed by Lt. Col. G. N. Carlson, Acting Division Engineer, while H. A. Whitcomb is Chief of the River and Harbor Operations Division.

For Black-Top Protection

A 4-page folder describing the applications of Jennite J-16 surface-sealing material has been prepared by Maintenance Inc., Wooster, Ohio. Jennite J-16, used for the protection of black-top pavement from oxidation, frost, water damage, and the deleterious effects of gasoline, motor oil, etc., may also be used for protection of structural steel, concrete foundations, metal roofing and siding, weather exposed insulation and other building materials. This product, the folder explains, does not require heating; it is applied cold by brush, spray or squeegee.

This literature may be obtained by using the Request Card at page 16. Circle No. 44.

Reinforced Concrete

A new textbook called "Basic Reinforced-Concrete Design—a Problems-Method Approach" has recently been authored by G. E. Large, C.E., Professor of Structural Engineering at The Ohio State University. Feature of the new work is the inclusion of examples, drill problems, laboratory problems, and discussions or quiz questions, along with a basic treatment on reinforced-concrete design. Feeling that the student should also know something about the great contributions that outstanding investigators have made in the field, the author has included photos and biographic sketches of a dozen such men.

The text, 334 pages long, treats the making of concrete, beams, bond, shear, diagonal tension, anchorage, columns, continuity, design of beam and girder floors, two-way and flat-slab floors, and footings. The appendix provides beam-flexure and column-flexure charts, building-code requirements as set forth in the ACI Code, and other miscellaneous data and information.

"Basic Reinforced-Concrete Design" is published by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. Price is $5.50.

Bituminous Distributors

Data sheets on Rosco bituminous distributors for truck, trailer, or semi-trailer are available from the Rosco Mfg. Co., 3118 Snelling Ave., Minneapolis 6, Minn.

The Model RQE for truck or trailer mounting is available with capacities of 800 to 2,000 gallons or larger and features Rosco 7-way valve control. The Model RQE-T is a "frameless" semi-trailer mounting which comes in standard sizes of 1,250 to 2,000 gallons and larger. It is said to be specially suitable where highway axle loads are restricted, and it permits immediate use of the tractor when the distributor is idle. The Model RRE, a rear-mounted unit, is designed specifically for quick field or shop mounting and removal from truck chassis. Illustrations, specifications, and dimensioned drawings are given for each model, as well as data on accessories and optional equipment.

A detailed data sheet is also available on the Rosco 4-section folding spraybar. Illustrations, drawings, and all construction features are outlined.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 37.

Words that are accurate enough to describe this fishbowl are no help to you in estimating and producing cubic feet of concrete. Architects, engineers and contractors **must know instantly and exactly** how much a mixer or paver drum will hold and properly mix. AGC Rating Plates give that information and guarantee it.

The AGC Rating Plate is your protection. Always look for it on any mixer or paver when you buy.

This AGC Rating Plate is your protection.

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THE FOOTE CO., INC. Nunda, N. Y.	KOEHRING COMPANY Milwaukee, Wis.	WORTHINGTON PUMP & MACHINERY CORP. Ransome Division, Dunellen, N. J.

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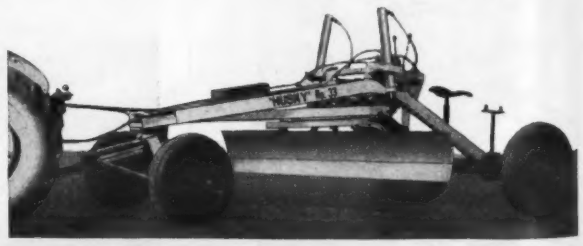
Are you using your heavy and expensive equipment for the light work? Save it for use on only the very tough jobs, and use HUSKY Road Graders on your every day road maintenance. You will save more than **25%.**

The HUSKY Road Grader is built for economical highway maintenance—for pulling behind truck or tractor (40-h.p. recommended). Easily controlled by the tractor operator alone. Resurfacing can be done at better than 4 miles per hour. Over 18 years of usage proves it has a life of 12 to 15 years and at less than $10.00 per year repair cost. The HUSKY is tough.

At Present, Immediate Delivery



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3. Low maintenance.
4. Well engineered.
5. Low cost.

Many State Highway Departments have proven the efficiency and economy of the HUSKY.

Check the economy of the HUSKY. Write for Bulletin #50 today. *Manufactured by*

NORTHFIELD IRON COMPANY P.O. Box 30-A Northfield, Minn. U.S.A.

Don't be silly! She is not standard equipment on the new Rex truck mixer. But her hand is resting on a lever which is. A flick, and it elevates the entire mixer body from a horizontal to a high-discharge position.

The Ups and Downs Of a Mixer Operator

Some mixer operators prefer the features of the horizontal-type truck mixer while others prefer the features of the high-discharge type. One might say, therefore, that the operator has his "ups and downs". Chain Belt Co., Milwaukee 14, Wis., believes it has a solution to the problem with the introduction of an adjustable-discharge mixer. A flick of the hand lever on the new unit elevates the entire mixer body from a horizontal position.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 134.

Composite Fastener Offers Insulation

A new composite screw, said to offer electrical insulation, shock resistance, and vibration damping, has been developed by Forman Insulating Screw Corp., 401 Broadway, New York 13, N. Y. Basically the new fastener consists of a serrated metal core which has been extrusion-coated with a thermoplastic material and then cut and threaded. Various lengths, head styles, types of thread, etc. are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 141.

Portable Compressors

A 4-page bulletin describing a complete line of portable industrial compressors, available in twelve models with capacities from 8 to 45 cubic feet, has been prepared by Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif. It points out that these compressors are equipped with Timken-bearing Quincy compressors, Wisconsin and Lauson air-cooled engines, adjustable automatic unloaders, and rigid electrically welded steel frames. It illustrates each model offered and gives specifications, applications, and suggestions for the proper spraying equipment to be used with each.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 1.

Huber Personnel Notes

George A. Howser has succeeded Willis R. Nye as Export Manager of the Huber Mfg. Co., Marion, Ohio. Mr. Nye resigned to enter missionary work in India. In his new position Mr. Howser directs the world-wide export distributor organization handling Huber's line in some 50 countries outside the United States and Canada.

Joe Porter has replaced Mr. Howser as District Sales Manager with headquarters in the company's main offices. He works with distributors in Ohio, Indiana, Illinois, Kentucky, West Virginia, and Michigan.

HRB Revises Its Booklet On Air-Entrained Concrete

The Highway Research Board has revised its "Current Road Problems Bulletin No. 13-R" on the use of air-entrained concrete in pavements and bridges. It was originally published in 1946 and over 15,000 copies have been distributed.

Much work has been done in the field of air-entraining in the past five years. The revised booklet brings together the best prevailing practices and the most widely accepted methods of test and control, along with the latest ASTM specifications.

This booklet may be obtained by writing to the Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. The price is 45 cents.

Maginniss NEW IMPROVED HI-LECTRIC CONCRETE VIBRATOR

PATENT NO. 2478701

HAS

No Flexible Shaft

9500 Vibrations a Minute

Electric Motor In Head

Write today for complete information

DEALERSHIPS OPEN

Maginniss POWER TOOL CO.

154 DISTL AVE., MANSFIELD, OHIO

Completely New Tooth Has 6 Major Features

More and more operators of excavating equipment are specifying the new AMSCO® Rever-SharP

The new Amsco Rever-SharP—designed for use with power shovels, draglines and rippers—is now available in a wide variety of sizes. This new tooth combines the ... work-hardening properti... ganese steel with a ... portant construc... The Rev... exten...

1. Manganese Steel Construction throughout—The Rever-SharP actually thrives on hard use . . . *the harder you use it, the harder it gets!*

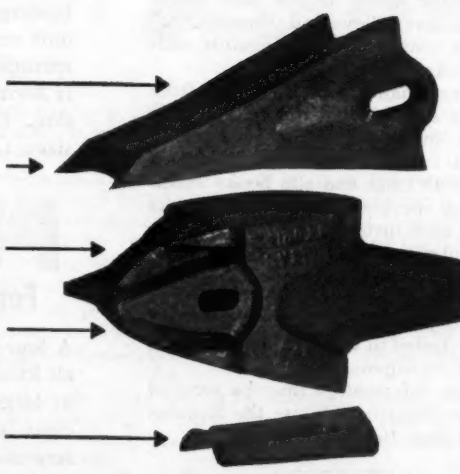
2. Reversible Tip—when the cutting edges of the Rever-SharP are finally worn, simply turn the tip over. *It's self-sharpening.*

3. Reinforced Cutting Edges—specially designed extended corners are the first to work-harden, thus equalizing wear along the entire length of the cutting edge.

4. Heavy, Rugged Adaptor—extra metal protects base connections and lips. Now available for all base connections.

5. Reinforced Adaptor Nose—supported by ribs along entire length, making bending or breakage practically impossible. Special taper makes lips self-tightening during use.

6. Tapered Lock-Key—easy to insert and remove. Has rubber insert—can't work loose in service.



Enthusiastic users of the new Rever-SharP report higher digging efficiency—and as much as 6 times longer tooth life. *It's a new development worth investigating—write today for the complete facts!*

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

395 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

The CP-9 Handril weighs 7½ pounds and can be one-hand operated.

Air-Powered Drill Held With One Hand

Sometimes you'll want a free hand when doing overhead drilling for installing pipes and conduits. The new CP-9 Handril made by Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y., is light enough to hold and center with one hand, the company says. This 7½-pound self-rotated air-operated hammer drill is designed for drilling and chipping work on stone, brick, or concrete.

The CP-9 is furnished with a metal carrying case that contains 3 star drills, 1 moil point, 2 wrenches, a flat 1-inch chisel, and a 1-pint can of oil. The star drills have 8-inch lengths and cut ½, ¾, and 1-inch holes. The Ajax chuck holds rotating drills and non-rotating chisels, and permits rapid drill-steel change, Chicago Pneumatic says.

Further information may be secured from the company by requesting Bulletin SP-3016. Or use the Request Card at page 16. Circle No. 112.

Chains and Fittings

An improved and more extensive line of Sterling wrought-iron sling chains has been announced by The Cleveland Chain & Mfg. Co., 545 Henry St., Cleveland, Ohio. This consists of single, double, 3-way, and 4-way slings of virtually any desired length, made of ⅜ to 1½-inch chain, with larger chain available on special order.

Designed for hazardous types of lifting, Sterling sling chains are said to resist kinking, bending, distortion, and overloads. Under heavy overloads they will stretch up to 30 per cent before breaking, says Cleveland, thereby providing a visual safeguard against sudden breaks.

Sterling chain is hand-forged from domestic double-refined hand-puddled iron or Swedish-charcoal Lancashire wrought iron. Sling chains are furnished with rings and slip hooks unless otherwise specified. Pear-shaped links may be used instead of rings, and grab hooks substituted for sling hooks when desired. Fittings are designed for strengths greater than the chain on which they are used. Each sling chain is proof-tested to twice its safe working load before shipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 41.

Baker Expands Again

The Baker Mfg. Co. is building a new brick and steel plant to increase its production of bulldozers, root rippers, sheepsfoot rollers, etc. The building will provide about 10,000 square feet of floor space and will be equipped with heavy-duty overhead cranes. This is Baker's second expansion within a year. The net result will be to double the plant's capacity.

Off-the-Road Tire

A new off-the-road tire in its Universal line, especially designed for front wheels where easier steering is desired, is announced by The B. F. Goodrich Co., Akron, Ohio. The ribbed tread has been specially engineered for this purpose, and construction of the tire is the same as the conventional Universal. The tire is available in three sizes: 12.00 x 24, 16-ply rating; 13.00 x 24, 18-ply rating; and 14.00 x 24, 20-ply rating.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 57.

Spex on Fireproofing

Two 4-page folders on fireproofing with lightweight Permalite plaster are available from the Great Lakes Carbon Corp., 18 E. 48th St., New York 17, N. Y. Intended for men specifying building materials, the booklets include actual detailed drawings and a short-form specification which may be used as part of the job specification.

One of the folders is on the fireproofing of steel columns and gives the necessary specifications for fire ratings of 1, 2, 3, or 4 hours. The other is on a suspended ceiling under noncombustible construction. This has a 4-hour fire rating.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 137.

Gorman-Rupp Has New Dept.

The Gorman-Rupp Co., Mansfield, Ohio, has established a department specializing in the development of small centrifugal pumps. Edward M. Smith is Hydraulic Engineer and Horace M. Montgomery is Project Engineer for this department. Both men were formerly employed by the Barnes Mfg. Co.

ROETH CONCRETE VIBRATOR

MOUNTED ON WHEELBARROW CHASSIS

Model 1—6 hp., 6000-7500 rpm
Model 2—4 hp., 5500-6500 rpm

Complete unit consists of engine mounted on wheelbarrow chassis, 21 feet of flexible shafting (three 7-foot sections) and vibrator head 2"x22", 2½"x16" or 3"x16". *Write for circular.*

ROETH VIBRATOR COMPANY, 1737 Farragut Avenue, Chicago, Illinois

TELSMITH® *more efficient screening*

VIBRO-KING

For Finished Screening of Medium and Small Sized Aggregate

With its two bearings, the Vibro-King is simpler, more efficient, and upkeep is lower. Telsmith-patented automatic counterweights assure smooth starting and stopping as well as exceptionally smooth operation. Its circular screening movement is uniform everywhere on the screen cloth, and is constant under any load. Entire vibrating mechanism, including vibrating unit and screen cloth, floats on nests of springs. Welded and reinforced main frame is *horizontal* for rigidity and easy installation. Cable suspension, if desired. Five sizes, 1, 2, or 3 decks.

VIBRO-KING 2-Bearing Screen

Changing Screen Cloth is Simple and Quick—The upper end of the Vibro-King is readily removable, making it a much easier job to change screen cloth and saving a great deal of time.

Screen Cloth Mounting—At customer's option—screen cloth may be mounted in rubber on steel screen trays; or stretched over steel screen supports—protected by rubber—on any deck or decks.

SEND FOR BULLETIN 266

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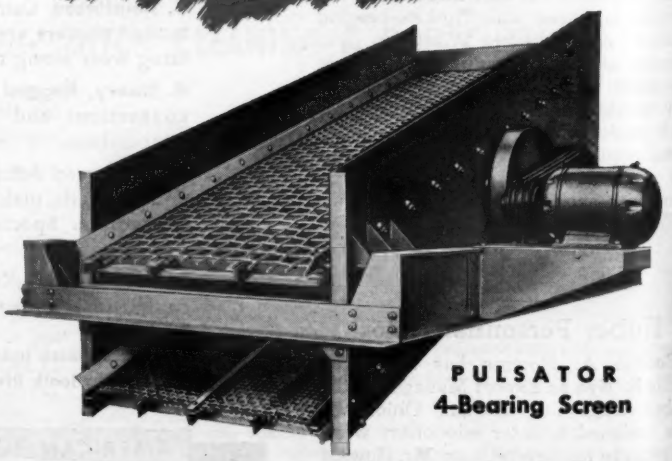
For Heavy-Duty Scalping

A four-bearing, heavy-duty vibrator . . . for all kinds of screening, especially scalping, or large sized aggregate . . . Pulsator's circular movement gives uniform, efficient screening on all decks and under heaviest loads. The best alloy steels, the finest antifriction bearings, protected by both labyrinth and piston ring seals, give longer life and lower upkeep. Eleven sizes, with 1, 2 or 3 decks. V-4



PULSATOR 4-Bearing Screen

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51 East 42nd St. New York 17, N.Y. • 211 W. Wacker Drive Chicago 6, Ill. • 713 Commercial Trust Bldg. Philadelphia 2, Pa. • 238 Main Street Cambridge 42, Mass. • Bochek Eqpt. Co. Milwaukee 3, Wis. • A. N. Wigle, 362 S. Ashburton Rd. Columbus 13, Ohio

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C. • Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

Concrete Road Adds Truck Lane on Hills

Relocated Indiana Route 37, Graded Two Years Ago, Is 22 Feet Wide, With Extra Truck Lanes for 12,000 Feet

✦ INDIANA'S longest highway project last year was a 22-foot concrete-paving job on the newly located State Route 37 between Martinsville and Bloomington. In 1947, under four different contracts, the grading for a modern roadbed was completed on a new alignment west of the original narrow, twisting, macadam highway. (See C. & E. M., May 1948, pg. 93.) Through two winters and springs the fills were permitted to settle. Last year the Indiana State Highway Commission awarded two contracts totaling $1,660,034 for paving the 16.2-mile route. An 8.8-mile section, going north from Bloomington, was completed by William D. Vogel, an Indianapolis contractor at an estimated cost of $968,029. Paving of the remaining 7.4 miles, described in this piece, was done by the Rieth-Riley Construction Co. of Goshen, Ind., for $692,005.

The 22-foot reinforced-concrete pavement is 7 inches thick at the center, but increases to a 9-inch depth for the outer 2 feet on each side of the slab. Its center crown is 1⅜ inches. Wide 11-foot shoulders flank the pavement except in rock cuts where the width has been reduced to 8 feet. Shoulders slope at the rate of one inch to the foot. Special subgrade treatment was included in the paving contract. This called for a sand cushion 24 feet wide, or one foot beyond the edge of pavement on each side, with a thickness of 5 inches at the center and 6 inches along the edges.

At three different locations on the northerly section, an extra 11-foot lane was added to the 22-foot pavement on long hills for the use of slow-moving trucks. With the added width, vehicles driving at normal speeds will not be held up by heavily laden trucks. The total length of these added truck lanes is nearly 12,000 linear feet. Maximum grade is 4 per cent, and there are no curves on the hilly sections. The sharpest curve in the horizontal alignment is 2 degrees.

Subgrade Treatment

Rieth-Riley obtained material for the foundation or cushion course under the pavement from a sand pit close to the north end of the contract. The granular material was dug out by a shovel, hauled to the job in trucks, spread out in two courses by a motor grader, and compacted by a 10-ton 3-wheel roller. Road forms were then set and pinned by hand 22 feet apart, for the pavement was laid full width. The contractor had 5,000 feet of Blaw-Knox forms on the job, and kept at least 700 feet trued up ahead of the paver.

Exact dimensions for the pavement were cut by a Jaeger subgrade machine, and the base course was then given a further rolling with a Fordson 3-wheel 3-ton roller. Since the paver worked in between the forms, gaps were left in the steel rails for the batch trucks to turn around and back up as they neared the paver. A scratch template was pulled along by the paver as a final check on the grade.

No expansion joints were used, but every 40 feet a contraction joint was placed across the slab. The assemblies came in two 11-foot sections and held ¾ x 24-inch dowels on 12-inch centers. Laclede Steel Co. of St. Louis supplied the joints and reinforcing steel for the job. A longitudinal tie bar, ⅝ x 48-inch, goes down the center of the pavement on 5-foot intervals. These dowels are under the steel reinforcing mesh which is 2 inches below the surface of the concrete.

C. & E. M. Photo
At Rieth-Riley's batch plant, a Koehring crane with an Owen clamshell bucket fills the Butler stone bin. That's a Butler sand bin at the left.

Where the truck lane was added, a keyway was built into the road forms on that side. Tie bars were also used to strengthen the bond between the adjoining slabs. On some of the sharp approach curves to the main highway, a longitudinal steel center joint was installed for extra reinforcing.

Batch Plant

In the meantime batch plants were set up along the southern outskirts of Martinsville; there were actually two plants, one for the aggregate and the other for the cement, about ¼ mile apart. The latter was on a small piece

(*Continued on next page*)

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
OR
THE SLOPE-METER CO.
MOUND, MINNESOTA

145-h.p. Model F-8 Big Job shown has G.V.W. rating of 22,000 lbs.

"My Ford F-8 outworks bigger make trucks 2 loads to 1"

—says **FRANK J. RAPANT**, So. Milwaukee, Wisconsin

SAVE WITH FORD!
AMERICA'S NO.1 TRUCK VALUE!

★ **SAVE GAS** with Ford Loadomatic Ignition and High Turbulence combustion chambers.

★ **SAVE OIL** with Ford Flightlight aluminum alloy pistons, cam ground for oil-saving fit at operating temperatures.

★ **SAVE ON REPAIRS** with demountable brake drums, brake inspection hole, engine-top setting of accessories, plus nationwide service from over 6,400 Ford Dealers.

★ **SAVE TIME** with Ford reliability and performance. Only Ford gives you a choice of V-8 or Six-cylinder truck engines!

"MY F-8 HAULS 8 and 9 ton loads of sand, gravel and backfill. It takes a 30 per cent grade in second gear and starts from a dead stop on highway in third.

"Hauling these big loads, I get 5½ m.p.g. Oil consumption is zero. And in 14,000 miles, it has cost me practically nothing for repairs, with no breakdowns or lost hours. I recommend the Ford Big Job to anyone for heavy duty pulling and hauling."—Frank J. Rapant, So. Milwaukee, Wisconsin.

Find out for yourself how Fords outwork trucks costing twice as much. Find out like Frank Rapant did, how they save on gas, oil, and repairs . . . how Ford Trucks do more per dollar.

There's a choice of over 175 Economy models—from light-duty Pickups to 145-h.p. Big Jobs to fit your job and your budget. Change to Ford economy! See your Ford Dealer this week!

Ford Trucking Costs Less Because—

FORD TRUCKS LAST LONGER

Using latest registration data on 6,592,000 trucks, life insurance experts prove Ford Trucks last longer!

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3251 Schaefer Rd., Dearborn, Mich.
Send me without charge or obligation, detail specifications on Ford Trucks for 1950.

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LIGHT MODELS ☐ **EXTRA HEAVY DUTY MODELS** ☐

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C. & E. M. Photo
A Koehring 34-E Twinbatch paver, working between Blaw-Knox forms, deposits concrete on the moistened subgrade of Indiana State Route 37.

Concrete Road

(Continued from preceding page)

of land at a siding of the Pennsylvania Railroad, and consisted of a Butler 250-barrel storage bin. Bulk air-entraining cement was obtained from two sources—Lehigh at Mitchell, Ind., and Lone Star at Greencastle, Ind.

At the larger aggregate-storage site, two Butler 70-ton bins were erected, one for the sand and the other for stone. The two-size stone used in the mix came from the France Stone Co. at Spencer, Ind. It was delivered by trucks and stockpiled around the bin. The sand was supplied by Clayton Winders of Spencer, Ind., from a pit within 100 yards of the batch plant. After the sand was pumped from the underwater pit, it was picked up by a Lima Paymaster crane with a 45-foot boom and a Kiesler ¾-yard clamshell bucket, and fed into the hopper of a Telsmith sand classifier. After processing, the sand was hauled by trucks to the storage bin and stockpiled. A Koehring crane with a 50-foot boom and a 1½-yard Owen clamshell bucket serviced the bins.

From 20 to 30 trucks, holding two batches each, hauled the materials from plant to paver. They backed under the stone and sand bins in that order for loading, then drove through the cement plant to complete the batch. There was a dead haul of 3½ miles to the north end of the job.

The Mix

Water for the concrete was pumped by a 3-inch pump from a creek crossing the highway and stored in a 1,600-gallon tank. A 900-gallon tank truck drove under this storage tank to bring a load of water to the paver. There the water was transferred by a 2-inch pump mounted on the truck into a larger 1,400-gallon tank truck which always worked along with the paver. The paver's own pump drew the water from the latter tank through a 75-foot length of 2-inch hose. As the water ran low in the larger tank, it was refilled by the smaller truck.

The dry weights of a typical 8.3-bag batch of concrete were as follows:

Cement	780 lbs.
Sand	1,582 lbs.
U-stone	1,094 lbs.
L-stone	1,782 lbs.
Water	36 gals.

Gradation of the sand and two sizes of stone follows:

Sieve Size	Per Cent Retained		
	U-Stone	L-Stone	Sand
2½-inch	0	....	....
2-inch	0-5	....	....
1½-inch	....	0	....
1-inch	80-100	2-15	....
¾-inch	95-100	15-40	....
½-inch	98-100	40-70	....
⅜-inch	....	....	0
No. 4	....	90-100	0-5
No. 8	....	95-100	5-20
No. 30	....	....	50-80
No. 50	....	....	80-95
No. 100	....	....	95-100

An average of 1½ barrels of cement was required for every cubic yard of concrete. The air content of the mix ranged from 3.0 to 4.2 per cent.

C. Floyd & Son of Bloomington hauled the batches to the paver. To avoid loss, the cement was carried in separate closed metal containers on the batch trucks.

Concrete Paving

Batches were mixed a total of 60 seconds in a Koehring 34-E Twinbatch paver equipped with a 35-foot boom and working between the oiled forms. The concrete was deposited on the moistened subgrade and struck off to steel depth by a planer pulled along by the paver. Longitudinal dowels and mesh reinforcing were set in place, more concrete was added, and the surface finished by a Blaw-Knox dual-screed finishing machine. Following this came a Flex-Plane machine which installed in the center line of the concrete an asphalt ribbon 3 inches deep x ⅛ inch wide.

This machine also cut the transverse joints at 40-foot intervals into which were fitted steel strips, 2 inches deep x ¼ inch wide. Right behind came a Koehring Longitudinal Finisher which was followed by hand-floating and straightedging. Air holes and bubbles were removed from the surface by a 15-inch-long rubber belt, after which a stiff bassine-fiber broom was pulled across the pavement. Finishers pulled the transverse steel strips once the concrete began to set up, and edged the joints with a ¼-inch-radius tool.

A black center stripe, 6 inches wide, of iron oxide was worked into the concrete from a rolling bridge. The material used was from ⅛ to ¼ inch in depth. In curing, the concrete was covered with burlap and then wet down. The following morning the burlap was removed and the pavement was covered with straw. This was kept wet for 4 days and then removed. No traffic was permitted, however, for 7 days from the time the concrete was laid.

Poured Joints

The 2½-inch-deep transverse joints were filled with asphalt in the bottom ½ inch, and with Sealz, a rubber compound, in the upper 1 inch. Two White heaters were on the job for heating each of the materials.

Paving started July 15, 1949, and by the end of August the concrete was completed on the main highway. Approaches and connections were finished during September, and the finishing

(Concluded on next page)

PROVEN PROFIT
ON BIG JOBS

A million yards of excavation or just a hundred...

Thousands of tons of steel to erect or only a few...

A mile of trench to dig or only a block...

Concrete to place for a huge dam or for a small culvert...

BIG or small, your jobs bring in bigger profits if you rely on Bucyrus-Erie excavators and cranes. Their proven speed, dependability, and durability show up in bigger output per day, per month, per year. That's why, all over the world, you find Bucyrus-Eries on so many jobs . . . BIG and small.

SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN

205E50C

touches to the project were cleaned up before the winter. The paving crew laid from 1,300 to 1,500 linear feet of full 22-foot concrete in an average 10½-hour work day.

Next to the pavement, a 32-inch strip of the shoulder was sodded. Another strip of sod, 32 inches wide, was laid along the outside of the shoulder at the slope break. The area between was fertilized with a 10-6-4 mix, and sowed with grass seed at the rate of 50 pounds to the acre—20 pounds of Kentucky bluegrass, 20 pounds of perennial rye grass, and 10 pounds of redtop.

Quantities and Personnel

The major items in the 7.4-mile concrete-paving project included the following:

Common excavation	20,721 cu. yds.
Excavation, special borrow	17,624 cu. yds.
Subgrade treatment	22,948 cu. yds.
Reinforced-concrete pavement	113,595 sq. yds.
Reinforcing steel	13,821 lbs.
Contraction joints	25,538 lin. ft.
Mulched seeding	93,343 sq. yds.
Sodding	48,551 sq. yds.

The Rieth-Riley Construction Co. employed an average force of 60 men on the contract under the direction of Fred Stockmaster, Superintendent.

For the Indiana State Highway Commission, John S. Taylor was Project Engineer. The Commission is headed by Samuel C. Hadden, Chairman. Ray H. Bower is Chief Engineer.

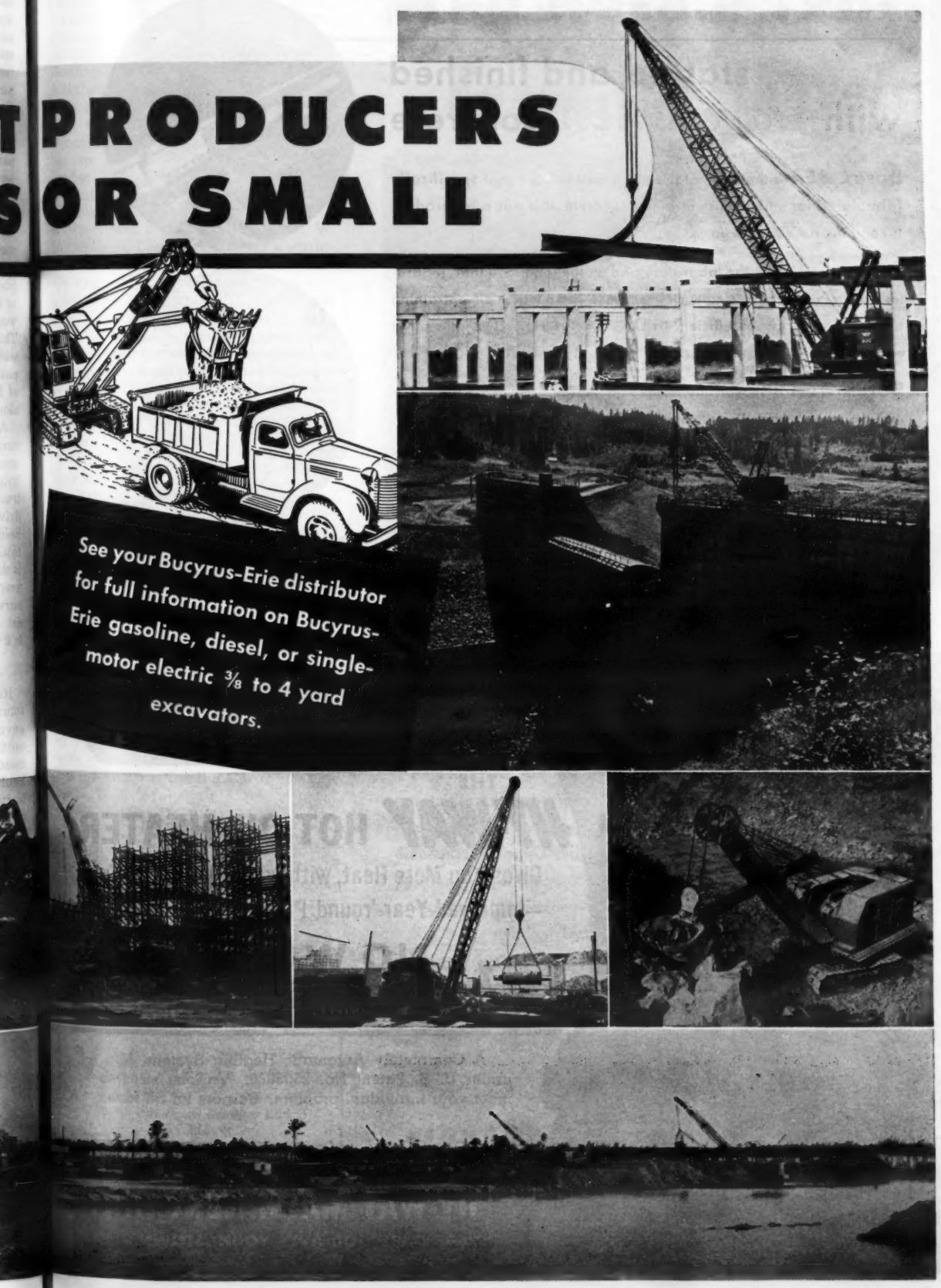
Rubber-Tire Roller Carries 50-Ton Load

Some new entries into the growing list of giant rubber-tire compaction rollers are the heavy-duty units manufactured by the Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E., Minneapolis, Minn. They feature oscillating axles and produce concentrated loaded weights ranging from 70,000 to 100,000 pounds. This particular weight range, Bros points out, fills a gap between the smaller standard oscillating-wheel pneumatic roller and the new larger compactors.

Loaded weights ranging from 70,000 to 100,000 pounds are produced by the two models of the Bros Roll-O-Pactor rubber-tire roller.

The Bros variable-weight Roll-O-Pactor pulls behind all types of tractors or prime movers, either crawler or rubber-tired, at speeds up to 15 mph. Four 24-ply tires, 18.00 x 24 and mounted on oscillating axles, concentrate weight, wheel oscillation, and kneading action. The Roll-O-Pactor is available in two models: the 35-ton Model 435 and the 50-ton Model 450. Body loading capacities are 448 and 640 cubic feet, respectively. Balanced design of the Bros roller is said to provide easy drawbar hookup and loading. The load flexibility of 10 tons empty to 35 tons filled and 12 tons empty to 50 tons filled makes these two units adaptable to many job conditions.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 39.


PRODUCERS
OR SMALL
See your Bucyrus-Erie distributor for full information on Bucyrus-Erie gasoline, diesel, or single-motor electric ⅜ to 4 yard excavators.

Power Belt Conveyor

A new portable conveyor, furnished in 10 and 16-inch belt widths and five standard lengths from 11 to 21 feet, has been announced by The Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich. Its box channel slider bed is formed of heat-treated aluminum alloy ⅛ inch thick, with steel trussing for added rigidity on 18½ and 21-foot models. The unit operates horizontally, or at any angle up to 40 degrees depending upon belt surfacing and materials conveyed. Two-way belt travel permits use in both loading and unloading operations.

Belt incline on the Stevedore, Jr., is adjusted by lifting the discharge end of the unit and setting it on a truck bed or loading dock. Guardrails, feeder sections, and other accessories may be added if desired. The new model is available with either cushion-rubber or pneumatic-tire wheels. The 6-inch cushion-rubber demountable tires have Hyatt-type roller bearings, with pressure-lubrication fittings. Pneumatic-tire wheels, 10 x 3.50 size, are equipped with permanently lubricated needle bearings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 143.

Pocket Paving Handbook

A new 80-page pocket-size edition of the "Bitumuls Paving Handbook" has been prepared by Stancal Asphalt & Bitumuls Co. operating west of the Rockies, and by American Bitumuls Co. in the east, both with headquarters at 200 Bush St., San Francisco 4, Calif. The handbook covers all aspects of paving techniques with Bitumuls emulsified asphalt and with other types of bituminous binders. It includes data on Laykold compounded asphalts for flooring, protective coatings, adhesives, and waterproofing.

Major divisions of this handbook offer: (1) Information on paving methods and materials, including data on tank-cars, distributors, drag brooms, and hand pumps. (2) Specifications on road and airport paving, including base, wearing surface, and seal (also detailed types of construction such as macadam, retread, sand-mix, armorcoat, and nonskid seal). (3) Complete tabular data on rates of application of asphaltic binders and quantities of aggregate required for various types of construction. (4) Condensed Asphalt Institute specifications on asphalt cement and cutbacks. (5) Listing of free booklets covering individual types of construction.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 56.

A dual V-belt drive from motor shaft to saw arbor shaft eliminates gears on the new Syntron portable electric saw.

Dual V-Belt Drive On New Portable Saw

A gearless portable electric saw with a universal motor drive developing up to 1½ hp has been developed by Syntron Co., 227 Lexington Ave., Homer City, Pa. It weighs 19 pounds and is fitted with an 8½-inch blade having a 2 11/16-inch-capacity cut.

A dual V-belt drive from the universal motor shaft to the saw arbor shaft eliminates gears, gear box, gear grease leakage, and gear maintenance expense, the company says; furthermore, the use of a flexible rubber V-belt cushions the motor from any sudden shock or overload. The result, Syntron states, is a vibrationless, high cutting speed.

Another new departure in saw design and construction is the use of tough metal stampings instead of castings. The saw is equipped with a base which adjusts for making bevel cuts of 90 to 45 degrees and for cutting depths up to the saw's maximum capacity of 2 11/16 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 83.

Metal-Lath Cutters

New metal-lath cutters are offered by H. K. Porter, Inc., Somerville, Mass., manufacturer of a complete line of metal-cutting tools. The new cutters have center cut jaws with specially pointed noses to allow cutting in narrow spaces. There are no protruding screws or bolts to catch while positioning for a cut. The cutters are said to cut cleanly, without distortion of the metal, all types of metal laths, flat-ribbed, reinforced, and specially patterned up to 3/16-inch diameter

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 150.

Film on Pipeline Construction

All phases of pipeline construction—including trenching, rock drilling, blasting, welding, doping, wrapping, laying, and backfilling—are pictured in a new construction film titled "As the Crow Flies", now being distributed by Gardner-Denver Co., Quincy, Ill.

All scenes were photographed in the Cumberland Mountains between Green Brier and Oak Ridge, Tenn. Action shows construction work on the 172-mile 22-inch natural-gas line laid by Oman-Fulton-Brodie Co. of Nashville, Tenn., and Lubbock and Amarillo, Texas, for the East Tennessee Natural Gas Co. A large part of the 172-mile line runs through rock, and the movie demonstrates a new rock-drilling technique used successfully on this job.

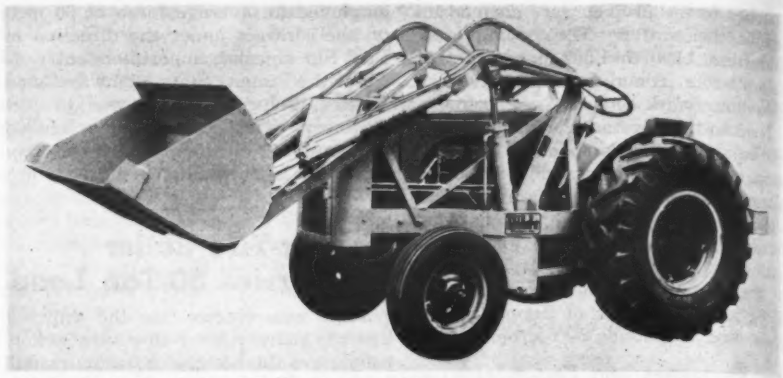
The approximate running time is 21 minutes for 750 feet of 16-mm film, black and white, with sound track. Bookings for interested groups may be arranged by contacting Gardner-Denver Co.

New DC Arc Welder

American Elin Corp., a newly formed American company with offices at 1 Wall St., New York, N. Y., announces that it is distributing the Elin Model RFN 300 dc arc welder, product of Elin Electrical Mfg. Co., Ltd., Vienna, Austria. Built to NEMA standards, the machine is a single-operator motor-driven series-excited dc welder rated at 60-375 amp, 1,750 rpm, and employs the cross-field operating principle.

Features claimed for the unit include stepless loss-free regulation of the welding current over the entire current range, automatic voltage adjustment, star-delta control, calibrated dial, independence of rotation direction, portability, and adaptability to both manual and automatic use.

Literature on this welder may be obtained from the company, or by using the Request Card at page 16. Circle No. 145.



Faster bucket control and better forward vision mark Lull's new line of Shoveloaders for Case and Minneapolis-Moline tractors.

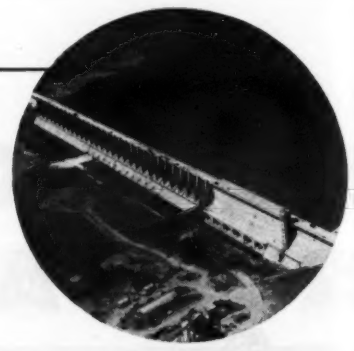
Front-End Loader With New Features

A newly designed and improved line of Shoveloaders for Case and Minneapolis-Moline tractors has been announced by Lull Mfg. Co., 3612 E. 44th St., Minneapolis 6, Minn. The hydraulic supply tank now forms the upper part of the radiator shield. This places it directly above the hydraulic pump and improves operating visibility. The removable ventilating section in the center of the shield permits easy servicing of front-end parts, Lull says. Bucket and hydraulic-pump capacities have been increased on the new models.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 124.

FORT GIBSON DAM

started and finished with Darex AEA concrete



Darex AEA is the only catalyzed air entraining agent specifically formulated for making air entrained concrete. It is not a by-product. It contains no vinsol resin.

Comparative tests in the laboratory and on the job prove that, regardless of imitative names and claims, there is no other air entraining agent for concrete as efficient as Darex AEA . . . no other that costs so little to use per cubic yard of quality concrete.

Darex AEA is specifically named in ASTM Specification C-175-48T as an accepted air entraining agent.

In the very lean, undersanded mixes used in mass concrete construction, Darex AEA increases placeability and eliminates the use of excess water. Bleeding and sand streaking are eliminated, and the resulting Darex AEA concrete is more durable, more resistant to freezing and thawing. Darex AEA is in use every where on every type of concrete construction . . . and in ready mix and concrete products plants using every known type of aggregate.

Dewey and Almy Chemical Company

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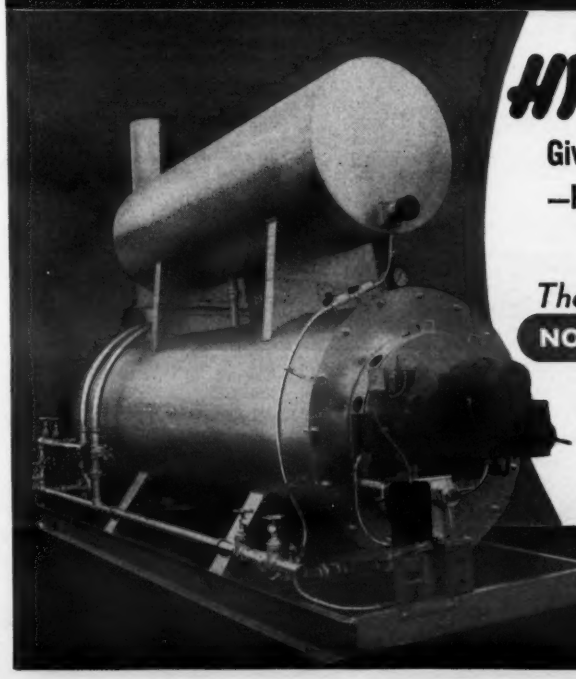

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Gives You More Heat, with Less Fuel, Lower Cost —Improved Year-'round Performance. Why?

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Therefore . . .

NO FREEZE • NO RUST • NO HIGH PRESSURE

A Completely Automatic Heating System, Mfd. under U. S. Patent No. 2503883. Various sizes to meet your individual problem. Burners for all fuels.

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Portrait in Print

By BILL QUIRK

Half-Century of Construction With the Frederick Snare Corp.

✦ NOBODY ever said to Frederick Snare, "Go south young man", but south he did go shortly after the turn of the century—south of the border that is, down Latin-America way. There the Frederick Snare Corp. has built up such an enviable reputation for integrity as contracting engineers that its foreign work almost overshadows a long record of some 1,250 successfully completed contracts on the domestic scene. Frederick Snare died in 1946 at the ripe old age of 82, but the well knit organization fashioned by him and his associates functions year in year out on the same sound basis of service to its clients that was instituted when the firm was founded in 1900.

Frederick Snare was a big man physically, and possessed vision commensurate with his stature. Born in Huntingdon, Pa., in the heart of the Allegheny Mountains, he drifted into the iron and steel industry in which he rose to the vice presidency of the Pencoyd Iron Works. This firm later became part of the present American Bridge Co. Snare was not entirely content working for others. He wanted a company of his own, so together with W. G. Triest a contractor, Arthur W. Buttenheim, Louis Shoemaker a structural engineer, and a lady stenographer, the firm of Snare & Triest was incorporated on January 1, 1900. These first five began business in two small rooms at 39 Cortland St. in New York City.

Triest retired in 1921, and the firm name was subsequently changed to the present Frederick Snare Corp., contracting engineers specializing in heavy construction. Of the founders only Arthur W. Buttenheim, now Chairman of the firm, is still living and playing an active role in the far-flung work of the greatly expanded business. New York headquarters now occupy the entire 28th floor of the Woolworth Building on Broadway in lower Manhattan. Looking out the office windows one cannot help seeing monuments to the construction skill of the company. Up the East River, past the sweep of the Brooklyn and Manhattan bridges, is the great Hudson Avenue powerhouse in Brooklyn, built for the Brooklyn-Edison Co. Down the Hudson River, just below the Statue of Liberty, is a long pier jutting out from Caven Point in Jersey City, N. J. This pier was both engineered and constructed during the last war for the Corps of Engineers, U. S. Army.

Modest Start

When the firm was getting under way in 1900, its jobs were on a modest scale, chiefly in fabrication and steel erection, also small bridges—phases of construction familiar to Snare from long experience. One of the sizable early contracts was the building of a steel-arch viaduct for the City of New York carrying Riverside Drive over 96th Street. This structure with its massive granite abutments and retaining walls shows little effect from the march of time since its completion in 1902.

That same year the internationally minded Snare was intrigued by an invitation from Gen. Leonard M. Wood, Military Governor of Cuba after the Spanish-American War, to bid on pier and terminal work at Matanzas. Few American contractors were venturesome enough to want a job in Cuba in those somewhat troublesome times. Snare wanted and got the contract, which was completed satisfactorily and in good order. Such was the start of the company's work in Latin America.

A permanent branch office was soon established in Havana, Cuba, and has

(Continued on next page)

C. & E. M. Photo

Arthur W. Buttenheim, present Chairman of Frederick Snare Corp., looks over the plans of a job with Vice President Randall Cremer at his side.

Vulcan Tools

A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

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35-43 Liberty Street, Quincy, Mass.

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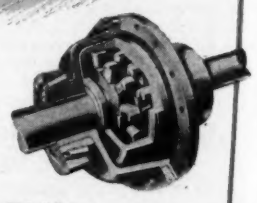
MACK MODEL LR...15-TON DUMP TRUCK

Keeps the Shovels HUSTLING

...Payloads Moving FAST



● Feature by feature—in every part—Mack Model LR is engineered to keep earth, rock, coal and ore moving away from the shovel—fast.

Regardless of weather or terrain, Model LR maintains positive traction through slippery mud or over uneven ground because of Mack's exclusive Power Divider differential. Power steering, air-assisted clutch, offset driver's position, proper weight distribution—all contribute to easy handling ...assure nimble maneuverability...fast, profitable hauling.

Study the standout features Model LR brings to your job. Compare them, point by point, with any other make of truck for off-highway dump work. You'll find they all add up to give you increased profits through faster time cycles and greater output at lower cost.

AMPLE HORSEPOWER: Standard engine, 196 h.p.; other engines from 150 h.p. to 306 h.p. Available in either gasoline, diesel or butane types.

MACK POWER DIVIDER: Assures good going through mud and over uneven ground by effectively transferring power to the wheel having the best traction.

MACK DUPLEX TRANSMISSION: Eight forward speeds provide a ratio range to meet the requirements of every off-highway hauling condition.

AIR-ASSISTED DOUBLE PLATE CLUTCH: Makes possible almost effortless operation; reduces driver fatigue to a minimum.

MACK PLANIDRIVE REAR AXLE: Three-pinion planetary final reduction gears located outboard of each wheel, provide large reduction without excessive size of carrier, differential or axle shafts.

POWER STEERING: Hydraulic power steering is shock-proof, positive and fast—gives easy, effortless control.

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RUBBER SUSPENSION: Mack rubber Shock Insulators on front springs and rear axle support-arms eliminate twisting strains, absorb vibration, require no lubrication or adjustment, and last indefinitely.

Be Profit-Wise

MODERNIZE WITH Mack

...outlasts them all!

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Underwood & Underwood Photo

Shortly after 1900, Frederick Snare went south, down Latin-America way, to build up the reputation his firm still enjoys as contracting engineers. He died in 1946 when he was 82.

Half-Century of Work With the Snare Corp.

(Continued from preceding page)

been active ever since. Other branches have subsequently been opened in Santiago, Chile; Bogota, Colombia; Guayaquil, Ecuador; Lima, Peru; San Juan, Puerto Rico; and Caracas, Venezuela. These seven key cities in seven different countries are the headquarters for construction work that has been carried out all over the West Indies and Central and South America. In this country, besides the home office in New York there is also a branch office in Philadelphia.

At present the firm is handling about $30,000,000 worth of work both at home and abroad. Its domestic activities are centered on two big bridge projects. On the $37,000,000 Chesapeake Bay Bridge project in Maryland, the company has a $6,723,254 contract for the construction of piers 11 to 23 and 28 to 31 inclusive—a 2-year job. Out on Long Island, New York, the firm is building both sub and superstructure for a $5,000,000 steel bascule bridge over Reynolds Channel at Atlantic Beach, Nassau County. This project will also take nearly two years to complete.

In Venezuela two major projects are nearly finished. One is an oil refinery at Puerto de la Cruz for the Sinclair Oil & Refining Co., on which Frederick Snare Corp. handled the design as well as the construction. The other is the La Guaira Port Works for the Venezuelan government, including design and construction of piers, bulkheads, warehouses, breakwaters, and dredging.

Modest Men

The top men at Frederick Snare Corp. are reluctant to take any personal credit for the success of their company. They pass the credit around the entire staff—the branch managers, the engineers, the superintendents, the foremen, the shovel operators, etc. In such a well balanced organization this attitude is no exaggeration of false modesty. It is more an acceptance of fact. The one grim, high-powered executive with the jutting jaw, piercing eye, and stentorian voice making snap decisions all over the place is conspicuous by his absence. The key men are all experienced, able executives, trained through the years to do their work quietly and efficiently.

These qualifications are well exemplified in Arthur W. Buttenheim, the present Chairman, who has been with the corporation since it was first organized; from 1929 to 1948 he served as President. He is a lean good-looking man of average height, with white hair and neatly clipped white mustache that go well with a rosy-pink complexion. A bachelor, his 72 years are carried lightly enough to pass for ten years less. Buttenheim was with Frederick Snare at the Pencoyd Iron Works for two years before the two left to go on their own.

One cannot get away from using the self-made-man cliche in describing the career of Arthur Buttenheim. Born in Jersey City, N. J., one of a family of seven—five boys and two girls—he left school at 15 to go to work when his father died. His first job was for James H. McGraw, of New York City, who published *The Street Railway Journal* and *American Electrician*, two early trade papers on the American scene. After nearly five years of the publishing business, and the never-ending task of writing letters soliciting advertising, he switched from magazines to iron and steel.

Incidentally, Buttenheim's four brothers, who also started from scratch, have made their way in a competitive world strictly on their own resources. Harold, the oldest, is Editor of *American City Magazine* and a national authority on city planning. Edgar is President of the Buttenheim-Dix Publishing Corp., which publishes this and other business papers. Dick is a lawyer, and Lester is Vice President of McKiernan-Terry Corp., a manufacturer of pile hammers and heavy-construction equipment.

Shorthand and Golf

Modern vocational-guidance counsellors might look askance at Arthur Buttenheim, who went from publishing, to manufacturing, to contracting without missing a step. "In those days you took whatever job you could get, at whatever salary was offered," he related. "Now a job seeker considers whether his aptitudes are exactly fitted for the work, along with future duties and salary, before he commits himself".

As a step to making himself generally useful, Buttenheim taught himself shorthand from a book. "I was a poor stenographer," he confesses, "so bad in fact that Frederick Snare, who was 16 years my senior, decided that my efforts would be more wisely expended along other lines."

Buttenheim gradually assumed more and more responsibility, which pleased Snare as it gave him more time for golf, at which he excelled. Snare headed amateur teams that toured Canada and Great Britain for series of international matches. Once the American contractor won a 10-shilling note on the golf

(Continued on next page)

Brand New Cedarapids

Built by IOWA

LARGER SCREENING CAPACITY

The large double deck (48" x 14'0") low angle Cedarapids Horizontal Vibrating Screen gives the extra screening area needed for big volume production on material with heavy fines content or contaminated with excessive amounts of soil, sand, clay and semi-wet material. Cedarapids Horizontal Screens are famous for their high capacity production at the lowest possible cost.

LARGER CONVEYORS

30" width conveyors are used in the Super Tandem Plant (instead of the 24" conveyors that are standard on the Junior Tandem) to take care of the increased capacity resulting from the larger screening area.

UNDERSCREEN SAND EJECTOR CONVEYOR

By means of the ejector conveyor control gate and the 48" x 7'6" Sand Ejector Conveyor that is built into the screen base frame, it is possible to remove all fines from the material or blend them into the crushed aggregate to meet the strictest specifications.

CONTROL PANEL IS EXTRA—WHEN REQUIRED

A controller is furnished with each vibrator, containing an operating switch, an electronic valve and a dial rheostat which varies the power of the vibration, permitting the controller to be set at the point which gives the best results. The electronic valve changes alternating current to pulsating waves with a time interval between each wave to give the vibrators a long stroke.

SYNTRON VIBRATORS EXTRA—IF REQUIRED

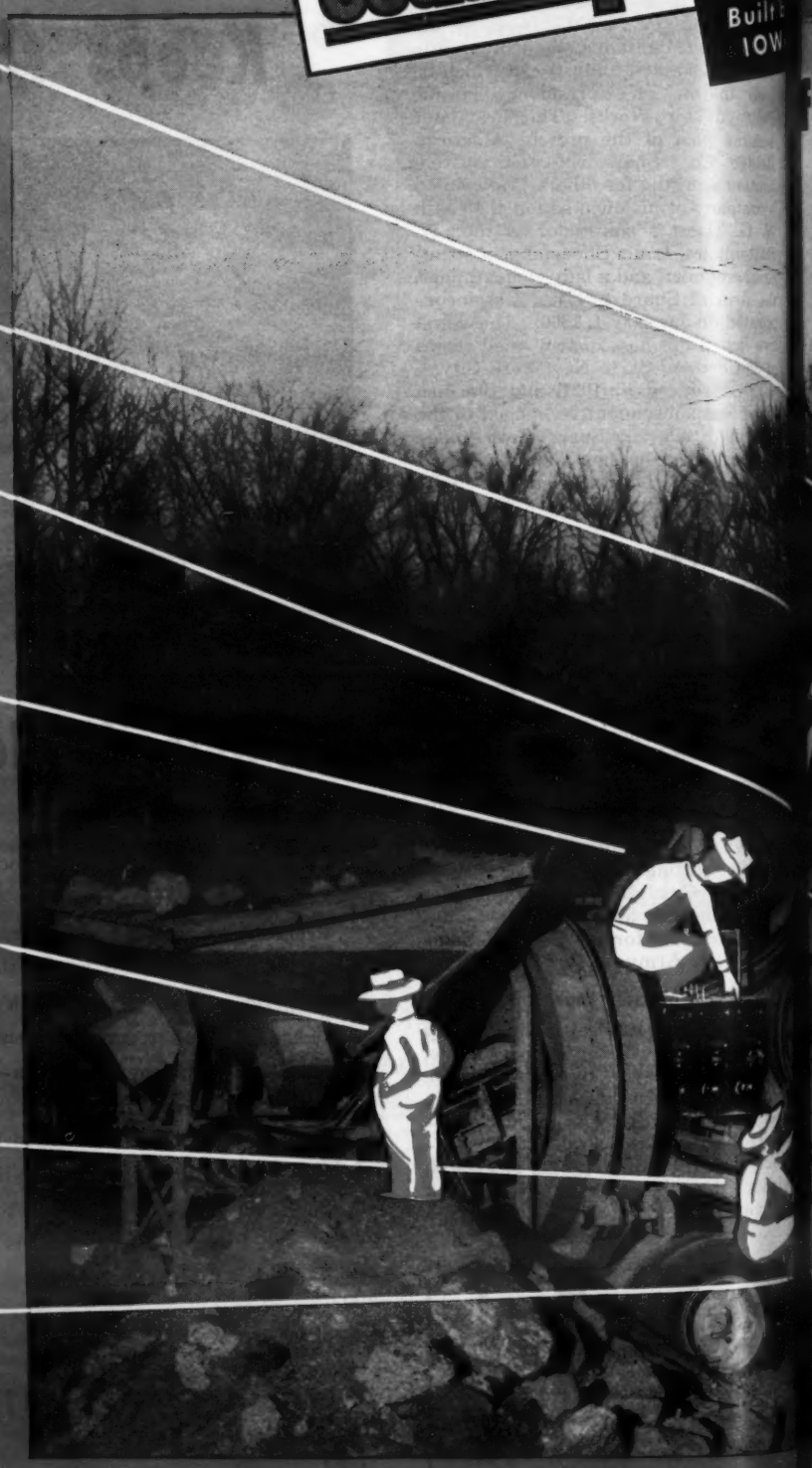
As extra equipment, six Syntron Vibrators are available for use on the hopper and under the screen bin to make stubborn materials flow freely, eliminate arching and plugging of wet material and to eliminate air pockets and voids, making it possible to produce aggregate in pits previously considered unworkable.

JAW CRUSHER

The Super Tandem uses either the 1024 or 1036 Jaw Crusher, the same as the Junior Tandem. All Cedarapids Jaw Crushers are engineered to give exceptionally high crushing capacity and the most economical operating cost per ton of finished product.

ROLL CRUSHER

For secondary crushing, the Super Tandem uses the same 2416 Cedarapids Roll Crusher used on the Junior Tandem. Manganese steel roll shells, large, heavy flywheels and other quality construction features assure maximum long life and thrifty operation.



THE IOWA LINE of Material Handling Equipment Includ

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SC
UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVE
• REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS &
PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • DOUBLE IMPELLER IMPACT

course from the present Duke of Windsor. A golfing monument to Snare is the well appointed Havana Country Club in Cuba which he built and which he also served as its President until his death.

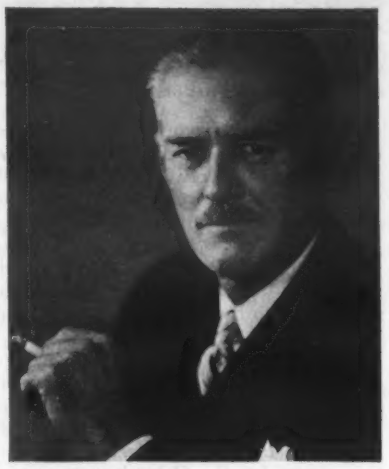
"Somebody once asked Mr. Snare if I too played golf", Buttenheim recalled, puffing on a pipe. "His answer was 'I should say not, no contracting firm can support more than one golfer and I am it.'" Buttenheim plays some golf and fishes enthusiastically, but construction has always been his prime interest. From a rolltop desk in the New York office, he has his finger on the pulse of all the corporation's activities.

Experienced Executives

Like Buttenheim, the rest of the Frederick Snare officials have spent many years with the corporation. Its President, handsome, 63-year-old George P. Seeley, has been with the firm ever since he received his engineering degree from college in 1909. At 59, scholarly looking Randall Cremer, First Vice President, has spent nearly all his business life with the company. Other Vice Presidents, E. R. Akers and Robert R. Ellis, Jr., have been with Frederick Snare for 30 and 22 years respectively. Manuel Gamba, Vice President and head of the Cuban office, has 28 years of service with the firm. Gamba is a Cuban architect-engineer who has a staff of only two Americans, the rest being Cubans.

Employment of local personnel on a large scale on out-of-the-States projects has worked out very well. On one important contract for the U. S. Navy, Bureau of Yards and Docks, in Cuba during the last war, the company had exactly 47 Americans on the payroll, along with some 7,000 Spanish-speaking Cubans. Naval officers on inspection tour, having visited other jobs where the labor was mainly imported, had to be shown the payrolls to convince them that it could be done.

Key officials have lived and worked many years in Latin America, speak the language, and know the habits and customs of the people of these countries. This undoubtedly is one of the reasons why Frederick Snare Corp. has such an unusual record of accomplishment in construction outside continental United States. Many prominent American contractors have stubbed their toes badly in foreign fields for various reasons. Frederick Snare staffs have efficiently gone about their work, completing over 750 contracts not only in Latin America, but also in such scattered places as Turkey, French Guinea, Alaska, and the Philippine Islands. Types of work here and overseas include ports, docks, railroad and shipping terminals, industrial mills and plants, bridges, powerhouses, dams, water-supply systems, heavy buildings, etc.



Fabian Bachrach Photo

George P. Seeley, President of Frederick Snare Corp., has been with the firm ever since he received his engineering degree from college in 1909.

Conservative Business

Frederick Snare Corp. does not regard contracting as a gamble, but rather as a stable business to be run on a basis of sound management. It is careful not to take on at one time so much work that it might spread too thin even an organization that has nearly 5,000 on its payroll. Its permanent trained personnel has been invaluable as a nucleus in setting up staffs for new jobs or expanding a branch office. This has been especially beneficial in Latin America where Spanish-speaking management and mechanics are essential to successful operation.

Top control, of course is exercised from the New York headquarters which has a force of 130 employees. Buying materials and supplies for millions of dollars worth of work, both home and abroad, keeps busy four purchasing agents with full staffs. Buying is complex enough, but routing and shipping everything from nails to derrick barges over the seven seas is equally important to the successful completion of a contract.

Unlike most U. S. engineering firms, Frederick Snare designers work with the metric system used in Latin America as fluently as with the English system of measurement. The combination of construction and engineering departments in the same firm has produced benefits to clients in the form of reduced costs. It is not unusual to see jobs finished for less than the estimated costs, even though such savings result in lower fees.

Preliminary estimates are made with great care, worked up from on-the-ground surveys and inspections that at times require pack mules for transportation of men into rough, densely grown, or hilly country. Nothing is left to chance or luck. Frederick Snare Corp. intends to finish every job it starts, and lays its groundwork accordingly.

Equipment

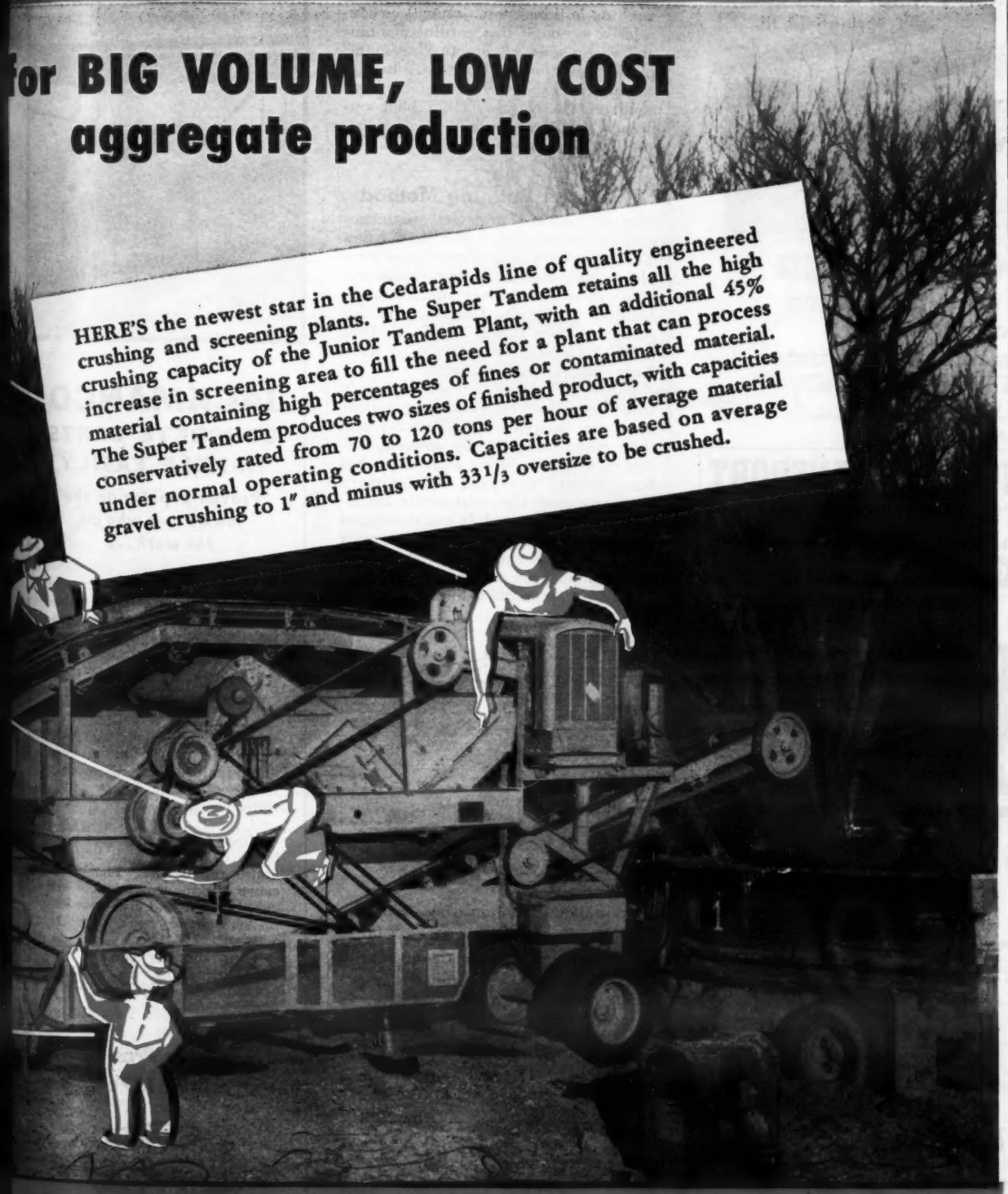
Big jobs require a large and varied amount of construction equipment. Plant headquarters are at Kearny, N. J., on the Passaic River, from which floating rigs can reach the sea. The Snare Corp. boasts one of the biggest derricks in New York harbor, equipped with 135 feet of boom and jib and capable of a 125-ton lift. However most of the

(*Concluded on next page*)

SUPER TANDEM

for BIG VOLUME, LOW COST aggregate production

HERE'S the newest star in the Cedarapids line of quality engineered crushing and screening plants. The Super Tandem retains all the high crushing capacity of the Junior Tandem Plant, with an additional 45% increase in screening area to fill the need for a plant that can process material containing high percentages of fines or contaminated material. The Super Tandem produces two sizes of finished product, with capacities conservatively rated from 70 to 120 tons per hour of average material under normal operating conditions. Capacities are based on average gravel crushing to 1" and minus with 33 1/3 oversize to be crushed.



OWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Half-Century of Work With the Snare Corp.

(*Continued from preceding page*)

equipment is kept working on the various jobs. On the Chesapeake Bay Bridge alone there is over $1,000,000 worth of floating equipment, plus a considerable amount of other plant. The branch offices in Cuba, Venezuela, Colombia, and Peru are all provided with their own fleets of equipment, in proportion to the jobs which are under way.

Aside from its design, engineering, and construction activities, Frederick Snare Corp. for ten years operated the Port of Callao for the government of Peru, and the Port of Cartagena thirteen years for the Colombian government. The government of Turkey has recently called on the American firm to act as consultant on the reconstruction of one of its ports on the Black Sea.

Monument for Posterity

As a result of its work south of the border, FSC is well known in Latin-American embassies at Washington, in the offices of their consul generals in New York, and in the public-works departments in the capitals of foreign countries. Chairman Buttenheim, too, has a wide interest in Latin-American affairs, being President of the Colombian-American Chamber of Commerce, and Vice President of both the Venezuelan-American Chamber of Commerce and the Pan-American Society.

But he views with equal pride the many construction accomplishments that are scattered across continental U. S., with a fair share of them within easy reach of the home office in New York City. The older ones in particular have an attachment tinged perhaps with sentiment. There is, for instance, the Delaware, Lackawanna & Western Railroad Co. rail and ferry terminal in Hoboken, N. J.—the foundations, a low-water concrete job unusual for 1905, are still in excellent shape today. Or the durable stone facades of Chelsea piers along the Hudson, used by the Cunard and other lines. Or the Brush Stadium, as it was called in 1911, on the banks of the Harlem River, now better known as the Polo Grounds and home of the N. Y. Giants baseball club.

"The magnificent sports stadium we completed last year in Havana is much more modern than the old Brush Stadium or Polo Grounds in the Bronx," said Buttenheim. "The modern structures are more functional too. The cost of the type of design on the older buildings and structures would be prohibitive today. We have moved ahead with the times both in design and construction over the past fifty years. Yet the company never could have grown to its present size and prominence except for the loyal and efficient organization that has been built up since 1900."

Even a casual observer would conservatively predict that when another fifty years roll around, Frederick Snare Corp. will still be at the same old stand, designing and constructing whatever it is called upon to build, either here at home or for its friends in Latin America. As in the past, no job will be considered so tough that careful planning and wise choice of directing personnel cannot put it on the right path to successful conclusion. Then, as they say south of the border, "Obra bien empezada, media acabada"—"A good beginning is half the work."

Kudos for Building Method

In the opinion of architects, engineers, and contractors who used it, the new Youtz-Slick building method was completely successful in its first commercial application on a 2-story administration building for Trinity University in San Antonio. (See C. & E. M., July, 1950, pg. 31.) James Stewart & Co., of New York City, was the contractor.

The raised-slab building method, in which concrete roof and upper floor slabs are poured on the ground and then raised into place by specially designed hydraulic lifting equipment, has been called "the most revolutionary forward step in the construction industry in half a century". It was developed by the Institute of Inventive Research in San Antonio and is now licensed to construction companies by Texstar Corp. The favorable comment came at an open forum sponsored by Texstar at the Institute laboratories.

Institute Director Vagtborg told the assembled contractors and engineers that much experience and development work is still needed to increase the cost-cutting capabilities of the new technique. O'Neal Ford, an architect for Trinity University, described the collaboration that went into the job. Robinson Brown, who developed the lifting equipment, described design and test problems. And John Porter, Institute engineer, said that savings per square foot of floor space on the Trinity job were approximately 30 cents.

U. S. Rubber Promotion

Nils Walter Swenson is now Assistant Manager of Branch Sales for the Mechanical Goods Division, United States Rubber Co., with headquarters in the company's New York offices in Rockefeller Center. He was formerly Manager of Mechanical Goods Sales for the Buffalo, N. Y., branch.

Twenty-six TRANSPORT MIXER TRUCKS
on the job for **Henry Nelch & Son Co.**
Springfield, Ill.

***The* TRANSPORT MIXER**
is an all-purpose unit, performing equally well for central mixed concrete and transit mixed concrete.

with VISIBLE MIXING ACTION
you see what goes on

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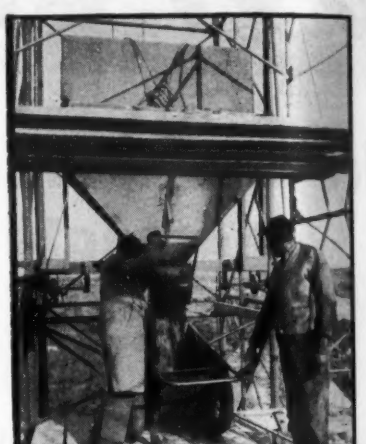
Serving the CONCRETE INDUSTRY 20 YEARS



JACKMANCO
CONCRETE CARTS HANDLE EASILY

Proven popular on the job by men who do the work . . .

Your men prefer to handle Jackmanco concrete carts because their work becomes easier.

This is accomplished through proper balance — taking as much of the load off the man as possible—and putting it on the cart, where it belongs. Another reason is the rocker dump feature. And still another is easy wheeling due to pencil roller bearings.

Your bookkeeper won't be bothered either, with maintenance repair bills. That's because Jackmanco products are quality built and give wonderful service for years.

Your supplier carries 'em. Ask him about his satisfied customers who specify JACKMANCO.

Superior Products since 1876

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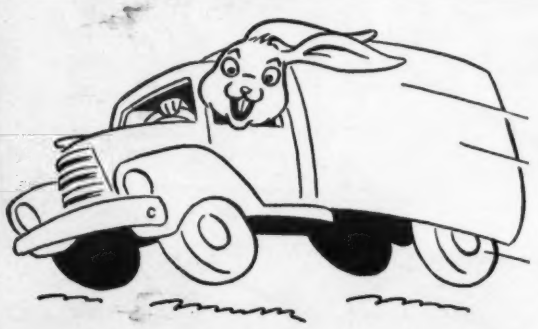
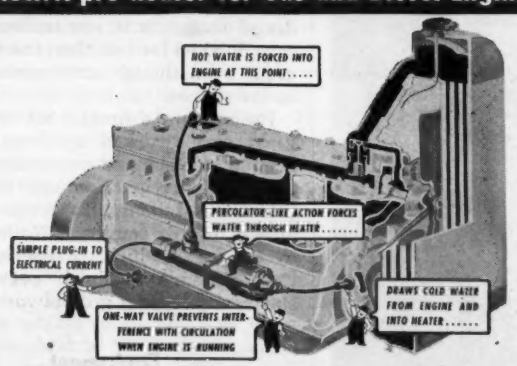
Jack Rabbit Starts in Winter . . . with
KIM Hotstart
REG. U.S. PAT. OFF.
electric pre-heater for Gas and Diesel Engines




HOT WATER IS FORCED INTO ENGINE AT THIS POINT.....
PERCOLATOR-LIKE ACTION FORCES WATER THROUGH HEATER.....
SIMPLE PLUG-IN TO ELECTRICAL CURRENT
DRAWS COLD WATER FROM ENGINE AND INTO HEATER.....
ONE-WAY VALVE PREVENTS INTERFERENCE WITH CIRCULATION WHEN ENGINE IS RUNNING

Fast action now means dollars saved in your winter operating budget. KIM Hotstart installations lick winter grief; end sluggish motors, end service tie-ups and high repair bills. KIM pre-heater means quick starts, efficient engine operation, lower cold weather operating costs all the way around.

See your International or Mack dealer or any leading auto supplier. Or write for literature. Better do it now. Cold weather doesn't wait for anybody!

8 Outstanding Features

- ✓ Gives quick, easy starts
- ✓ Reduces motor wear
- ✓ Prolongs battery life
- ✓ Four models—quickly installed
- ✓ Reduces fuel consumption
- ✓ Saves warm-up time
- ✓ Cuts costs of terminal heating
- ✓ For stationary or mobile engines—diesel or gas

KIM HOTSTART MFG. CO.
West 917 Broadway, Spokane 11, Wn.
Please send literature, prices, name of local KIM dealer.
Name_____
Company_____
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City_____ Zone____ State_____

The 4/5-yard shovel of the Lessmann shovel-loader can be completely filled without moving the tractor. The unit carries its load at any angle close to the tractor from 1 foot up to 7 feet high.

New Shovel-Loader

A new front-end shovel-loader—one in which the shovel can be loaded without moving the tractor—has been developed by the Lessmann Mfg. Co., 20th and Easton Blvd., Des Moines, Iowa. The new design of this unit permits locking the tractor brake and operating the lifter and crowder arms to fill the 4/5-yard shovel bucket completely. The shovel has a 42-inch forward sweep.

Crowder arms are effective in any position from 15 inches below the wheel level to 7 feet above, the company says. Maximum dumping height is approximately 8 feet from ground surface to bucket lip. The unit is controlled by four 7,700-pound cylinders operating under 1,000 psi.

The shovel-loader features dual hydraulic shovel control and a self-locking device for digging purposes. It can be equipped with a backfiller blade controlled by hydraulic cylinders for a digging angle, planing angle, or leveling angle. The load can be retracted close to the tractor unit for carrying. This, the company points out, reduces the danger of tipping or teetering.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 27.

Special-Machinery Brochure

A brochure illustrating production facilities for the manufacture of a wide range of complete special machinery, subassemblies, and precision parts has been released by McKiernan-Terry Corp., Special Machinery Division, 15 Park Row, New York 7, N. Y.

Shown in the brochure are illustrations of some of the company's 30 vertical and horizontal boring mills, 70 turret and engine lathes, and dozens of radial drills, grinders, planers, millers, and other equipment for work of all types and sizes, including welding and stress-relieving. Indicative of the requirements that can be met are illustrations of machines that can bore and hone holes 40 feet in length and 42 inches in diameter to a mirror-like finish, and engine lathes 95 feet long. The bulletin outlines McKiernan-Terry's facilities and explains how its equipment has been used in manufacturing special machinery for various industries.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 81.

Trailers for Equipment

Operating a folding gooseneck trailer is as simple as A-B-C, according to the new 4-page folder put out by Martin Machine Co., Kewanee, Ill.; "No ramps or cribbing are needed. It's a one-man operation." The catalog also outlines the other features of Martin gooseneck trailers, which are available in 20, 27, and 30-ton capacities. It illustrates the loading operations for various types of equipment and includes complete dimensions and specifications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 128.

Speaking Can Be Easy —Even for Engineers

Parched throat? Weakness in the knees? Slight fever and sudden loss of memory? If you're afflicted this way when you have to address or chairman a group, there's a little book that may help. It's called "Speaking Can Be Easy . . . for Engineers Too" and it's distributed by the Engineers' Council for Professional Development.

The section on "The Speaker" suggests some basic questions one should answer when preparing a talk, like why am I speaking? To inform, explain, or convince? What kind of presentation shall I select? (Memorizing and reading are "hopeless".) How can I plan and prepare what I have to say? How can I make contact with my audience? It suggests visual aids and ways to display them, and adds a word about platform manners and microphone techniques.

The section on "Meetings" outlines the chairman's role (one in which he subordinates his own personality but coordinates the speeches of others). It includes tips on introductions, on question-asking and answering on the panel discussion, on attracting an audience in the first place through good promotion devices.

You may still have that parched throat and those weak knees when you finish the little book, but those are healthy signs in the long run: "The best speeches are usually made by those who are 'keyed up' to the challenge of the occasion." And if you want more help, there's a bibliography of references on speaking, meetings, visual aids, etc. in the back of the booklet. The Council's address is 39 W. 39th St., New York, N. Y., and the booklet costs 50 cents.

Guide to Steel Selection

A 4-page bulletin listing all popular grades of hot-rolled and cold-finished carbon and alloy-steel bars is offered by Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80, Ill. It lists the principal characteristics, mechanical properties, and uses for each of the steels.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 122.

Southwest's complete, standardized line affords construction men an opportunity to fill their needs from one dependable source. From start to finish, no matter whether Allis-Chalmers, Caterpillar, International or Cletrac tractors are used, an economical Southwest unit is available to bring you increased profits.

In addition to the standard line, special Southwest Dump Wagons, Tampers, Heavy Duty Compaction Units, etc., are giving outstanding performance on out-of-the-ordinary jobs all over the country . . . Why not let Southwest help solve YOUR problems?

CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Company
ALHAMBRA, CALIFORNIA

Automatic saving is sure saving—U.S. Savings Bonds

Contributed by this magazine in co-operation with the Magazine Publishers of America as a public service.

The Creeper concrete saw cuts wet or dry. It trims precast-concrete floor and roof slabs or the edges of curbing and paving; it cuts channels or machinery-foundation openings in concrete floors; and it cuts out sections of flooring or sidewalk for repair.

A New Concrete Saw

Wet or dry cutting, a maximum cutting depth of nearly 5 inches, and electric motor power are the features of the new Creeper concrete saw developed by Martin Fireproofing Corp., 2200 Military Road, Buffalo 17, N. Y. This saw is designed for a number of uses: trimming floors and roof edges of precast-concrete slabs, trimming curbing or paving edges, cutting channels or foundation openings in concrete floors for installation of machinery, and cutting broken or unwanted sections of flooring or sidewalks for repair.

The Creeper saw has a maximum blade capacity of 14 inches and is powered by a 1½-hp dustproof motor operating on 115 to 230-volt 60-cycle current. The unit is entirely portable and uses a special bonded abrasive for wet cutting and an abrasive wheel for dry cutting. It operates on guide rails for cutting accuracy.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 31.

Marvel Company Retires

The Marvel Equipment Co. of Chicago has retired from the construction-equipment business after eleven years because of the ill health of its president, O. E. Quinton. It has turned over the manufacture and sale of Marvel asphalt kettles, distributors, pouring pots, etc. to the Tri-Line Co. of Racine, Wis.; and the manufacture and sale of Marvel vibrators, grinders, flexible-shaft machines, and portable saws to Marvel Equipment Corp. (The Flexible Shaft Co.) at 215-217 Eagle St., Brooklyn, N. Y.

Pa. Turnpike to Have Modern Radio System

The Pennsylvania Turnpike Commission is installing a radio communication system throughout the Pennsylvania Turnpike. Interchanges, maintenance buildings and headquarters, tunnel-portal buildings, police headquarters, the Harrisburg Turnpike office, patrol vehicles, and emergency trucks will be equipped with two-way radio. The system will be divided at Everett, Pa., and simultaneous conversations may be carried on in the eastern and western sections. In each of the operating sections all communications will be heard by all fixed and mobile stations. Any message originating in one section which is of interest to the other section can be repeated at Everett. In addition, teleprinter facilities will be provided between several stations.

The heart of the communication system is a chain of unattended microwave relay stations at elevated sites along the Turnpike. Operating in the 952 to 960-mc portion of the spectrum recently made available by the Federal Communications Commission, these stations automatically receive and retransmit messages. At carefully selected locations, stations in the 152 to 162-mc band connect with the microwave relay system to provide for communication to fixed and mobile units in the area adjacent to each.

With the system in effect it will be possible for patrol vehicles to relay emergency messages to vehicles using the highway. The system will decrease the time necessary to summon aid in case of accidents and other emergencies, and it will speed up maintenance activity made necessary by local weather conditions such as sleet storms.

The system was engineered, designed, and is being installed by Raymond Rosen Engineering Products, Inc., of Philadelphia, Pa., working in conjunction with the J. E. Greiner Co. of Baltimore, Md., consulting engineers for the Pennsylvania Turnpike Commission.

Construction Equipment

Two new catalogs have recently been prepared by the Caterpillar Tractor Co., Peoria 8, Ill., on its extensive line of construction machinery.

The first, a 32-page booklet titled "Building With Caterpillar", offers information on and illustrations of road construction, dam building, airport and railroad maintenance, pit and quarry work, pipeline jobs, erection work, drilling, logging, and stream control. The second of these illustrated booklets describes practically every part of the Caterpillar D7 diesel tractor. It gives complete specifications and analyzes the features of the engine and the frame.

This literature may be obtained from the company by requesting Form 12770 for the general booklet and Form 12678 for the catalog on the D7. Or use the Request Card at page 16. Circle Nos. 131 and 132 respectively.

SCARIFIES...
PULVERIZES..
MIXES...

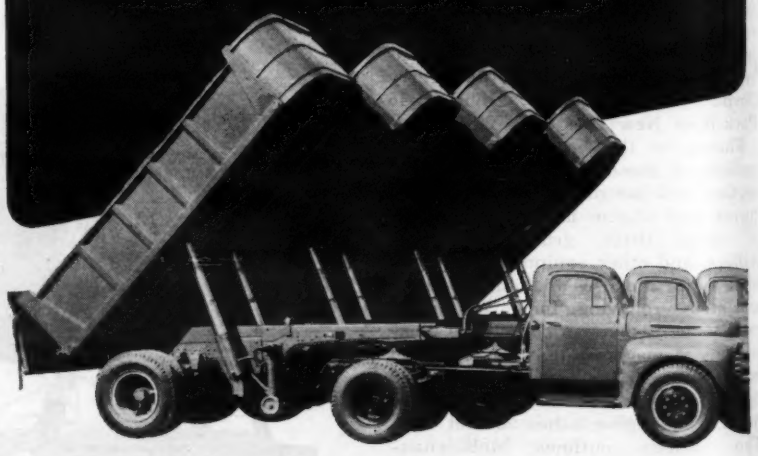
WOOD
Heavy Duty
PREPARIZER
P-600

● Tears up old asphalt or macadam surfaces and pulverizes into select aggregate for low-cost reuse. Also prepares adobes, clays and other soils for mix-in-place construction. Tractor drawn...self-contained power plant for pulverizing...hydraulic jack depth control...pneumatic tires.

Roadbuilders save as much as $3000 per mile with a WOOD P-600 PREPARIZER. Write today for full details!

ROADBUILDING EQUIPMENT
WOOD MANUFACTURING CO.
BOX 620 · 6900 TUJUNGA AVENUE · NORTH HOLLYWOOD, CALIF.

Get More Trips per Truck-Day with "On the Job" Design



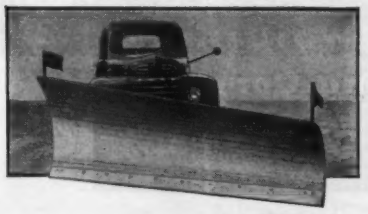
Boost the daily payload of your trucks by taking advantage of the special features built into Marion Bodies and Hoists. Under actual work conditions, Marion engineers design each unit to fit the particular needs of every hauling job. This assures peak performance and rugged, dependable stamina for your individual truck requirements. Write for complete catalog today.

Model Illustrated: Marion 12 cu. yd. semi-trailer dump bodies for hauling crushed stone and gravel. Mounted over Marion twin telescopic 7" hoist.

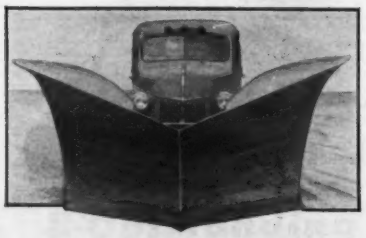
GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION BODIES AND HOISTS
MARION METAL PRODUCTS CO., MARION, OHIO

SNOW REMOVAL
with GLEDHILL plows



The well known, efficient one way plow. Fits all trucks • Easily attached • Fold back hoist • Automatic blade trip • Sturdy, all-welded construction.



Gledhill's V-Plow — Wide wing span • Heavy duty construction • Interchangeable • Direct lift • Reasonably priced.

Write for complete specifications!

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

Hospital Foundation Sealed Against Water

Heavy Mat for VA Hospital Rests on Slab Covered by Roof Paper and Plant-Mix; Jet-Driven Timber Piles

(Photo on Page 1)

✦ AN unusually heavy foundation for a new 10-story VA hospital, in unusual subsurface conditions, required the use of some unusual construction practices. The Veterans Administration 500-bed hospital going up in New Orleans, La., was designed by Architects-Engineers Favrot Reed, Mathes & Bergman of New Orleans, and Faulkner & Stenhouse of Washington, D. C. It is under contract to Robert E. McKee, general contractor of Dallas, Texas, and is being built under the supervision of the District Engineer, Col. Charles G. Holle, Corps of Engineers, U. S. Army, New Orleans District, at a cost of $7,984,917. Work got under way in September, 1949, and is scheduled for completion in October, 1951.

The heavily reinforced concrete foundation with layers totaling over 5 feet in thickness is supported on timber piles generally 76 feet long. Old concrete foundations at the site, together with underground gas and water and thick strata of sand, were some of the problems encountered. A combination of roofing material and hot plant-mix, laid in the foundation, was the unique but effective way of insuring a watertight building from the bottom up.

Located on a large plot of ground, the new building fronts on Perdido Street, while at its rear on Gravier Street is the massive Charity Hospital of Louisiana. On the western side, the Nurses Home on South Claiborne Avenue overlooks the site. Other allied buildings closely grouped in the area are the Louisiana State University Medical Center, and the Tulane University School of Medicine, situated at either end of Charity Hospital.

Irregular in shape, the new VA hospital will measure roughly about 350 feet in each direction; the first story will cover 38,000 square feet of floor area. The framework is reinforced-concrete construction. Off one corner will be a separate nurses' home. Another building will be erected off the diagonally opposite corner to house a garage, boiler room, and laundry.

Old Gas Plant

Back in 1835 an illuminating-gas plant was built on this plot of ground, and subsequently enlarged over the years. After natural gas in Louisiana superseded the manufactured variety, the plant was abandoned, but its old concrete foundations, 6 to 8 feet thick, remained to pose a problem of removal to the contractor. Excavation at the site was done by a subcontractor, Gulf States Contractor Co. of Hattiesburg, Miss. In digging a hole 6 feet deep as the first step in the foundation, the contractor was forced to remove about 8,000 yards of concrete which had served as footings for the machinery in the old building.

Because of the proximity to other hospital buildings in the area, only the lightest of blasting was permitted in the demolition. Single sticks of 40 per cent dynamite were shot at a time, and the chunks of concrete were then battered into rubble by 5,000-pound steel balls swung by an Osgood 1½-yard and a Koehring ¾-yard crane. The rigs then loaded the refuse into trucks which hauled it away.

From the bottom of this shallow cut, 76-foot timber foundation piles were driven to a depth of 87 feet below that level by means of a follower used with the driving rig. For this foundation, 2,017 piles were required. In general, pine piles obtained locally were used, but because of the great length, a portion of the piles were fir, shipped to the job from the forests of Oregon. They average 7-inch tips and 13-inch butts. Since the piles will be permanently wet, they are untreated.

Pile Driving

The pile driving was done by Leston

(Continued on next page)

C. & E. M. Photo

The site for the new VA hospital in New Orleans with the Charity Hospital of Louisiana in the background. The project is scheduled for completion in 1951.

LIST & CLARK, General Contractor, and PERRY McGLONE, Sub-Contractor, are using LaPLANT-CHOATE MOTOR SCRAPERS on the Burlington R. R. relocation job in Northwest Missouri

3½ MILLION YARDS of tough heavy material to be moved on a job 42 miles long! That's the kind of earthmoving that calls for rugged, broad shouldered power, big capacity and dependable high speed operation. List & Clark with seven TS-300's and Perry McGlone with six depend on LPC Motor Scraper performance to lick this tough job at a profit-setting pace.

The Motor Scraper has many high production featu worth knowing about—ask your LPC Distributor to sh you these units in action—get the whole story from n who own or operate them. LaPlant-Choate Manufact ing Co., Inc., Cedar Rapids, Iowa — LaPlant-Choate Sa and Service, 1022 77th Avenue, Oakla California.

LAPLANT CHOATE

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

Hospital Foundation Sealed Against Water

(*Continued from preceding page*)

Watson of Dallas, Texas. Piles were driven through two or three different layers of sand, separated by seams of clay and muck, into a stratum of densely packed sand. Because of the nature of the subsurface at the site, the piles were sunk to grade with a combination of jetting and driving, using a separate rig for each operation. Jetting was done with a Marion crawler crane having an 80-foot boom and 70-foot leads, employing a rotary bit drill like the type used in drilling oil wells. Along each side of this bit was a ¾-inch jet through which water was forced by a force pump.

With this piece of equipment, 14-inch-diameter holes were bored 60 feet into the earth. Clay forced against the side walls of the slender shaft by the action of the water kept the sand from filling in the hole. When the piles were slid into these holes they usually sank 30 to 40 feet before they had to be driven. The process was slow, but the piles were placed with exacting plumbness and extreme accurary as to location.

Then they were driven by a Vulcan No. 1 hammer handled by a rig with an 80-foot boom and 70-foot steel leads, and supported on steel I-beams. The follower used with the driver permitted the piles to be driven through the ground to proper grade. They were closely spaced on an average of 4-foot centers both ways.

The entire foundation was then enclosed by a cofferdam constructed of Carnegie-Illinois MZ-22 steel sheet piling 38 feet in length, driven into the first layer of sand. Excavation proceeded within the protecting sheeting down to pile grade. Piles were cut off at proper level by a Mall chain saw pneumatically driven by a Le Roi 210-cfm air compressor. The enclosures were unwatered by a battery of pumps that included a 6-inch Gardner-Denver and several smaller 2 and 3-inch units —these latter included Jaeger, Rex, and CMC.

Ground water, though encountered just below the surface, provided no unusual problem, and the stout walls of sheeting kept the dirt from sloughing in. Progress was retarded, however, by the difficulty in getting steel sheeting when it was needed because of a strike in the steel industry. Sheeting was pulled when the foundation, including basement walls, was poured.

C. & E. M. Photo

Chevrolet-mounted Jaeger 2-yard truck mixers roll under a Blaw-Knox aggregate bin at Contractor McKee's batch plant on the New Orleans VA hospital job.

Concrete Mat Foundation

Original ground elevation at the site averages 23.0 Cairo datum. Backfill will later bring the grade around the building to 24.0, with the first-floor elevation at 30.0. Basement-floor elevation is 17.0, with the floor of the subbasement at 7.4. Piles were cut off at 0.75 elevation, which is also the grade of a 5-inch seal course of plain concrete that was laid in the hole to serve as a working platform. The piles come through this course to the surface of the concrete.

In this part of Louisiana gas and water often work up from deep in the ground and cause trouble in foundations. On this job both gas and water rose through the fibers of the piles, but the contractor trapped them before they got beyond the seal course by placing a ½-inch layer of sand over the concrete, and covering the sand with Sisalkraft paper. Joints in the paper were sealed with roofing cement to prevent any leaks. While the gas and water percolated through the piles, they were contained by the paper, and dissipated themselves off to the sides through the medium of the sand. At times the gas pockets were strong enough to raise the paper, but no break-through occurred.

Over the seal course a concrete leveling course was placed to a depth of 13

(*Concluded on next page*)

LUG-ALL
All Purpose
WINCH-HOIST

WEIGHS ONLY 8½ LBS., YET LIFTS, PULLS OR LOWERS 1½ TONS DISTANCE OF 7½ FT., OR ¾ TON DISTANCE OF 15 FT.

LUG-ALL has a built-in 'snatch block' and three swivel hooks for work around corners or in cramped quarters as close as 10½ inches. No brake to slip. 133 ft. of flexible aircraft cable. SAFETY HANDLE prevents accidental overload.

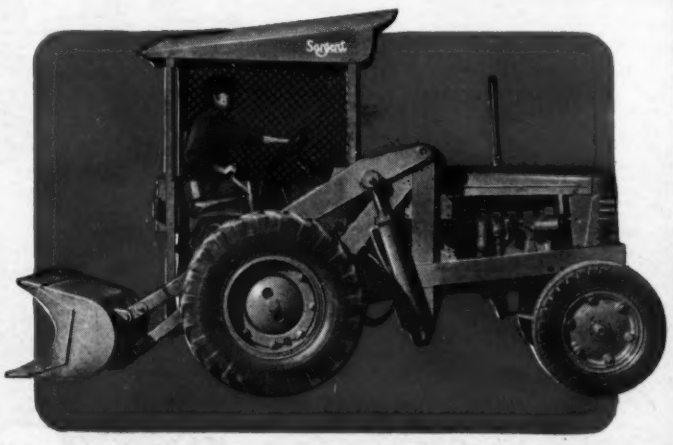
WEIGHT 8½ LBS.
CAPACITY 1½ TONS

...AND IT COSTS ONLY $99.50

LOWER COST
LOWER MAINTENANCE COST... THAT'S LUG-ALL

THE LUG-ALL COMPANY
Wynnewood 2, Pa.

Now... the Most Versatile Loader on Wheels!

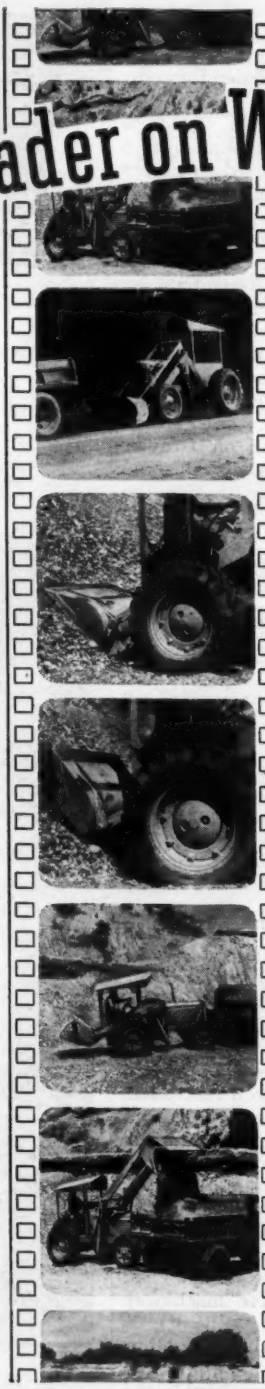


Here's the most versatile, practical loader ever developed for wheel tractors. It can dig in front . . . dump in front like the conventional loader. BUT, it can also dig in *back* and load in *front.*

You can dig in back . . . move straight forward to the truck . . . the bucket swings *straight over* the roof . . . and the load is dumped into the truck. Thus you eliminate the turning necessary with ordinary front end loaders . . . eliminate *half* the gear shifts and *half* the clutch wear. You save time and fuel . . . cut operator fatigue. You speed loader operations . . . *can load at better than a yard a minute.*

You get far greater traction and almost effortless steering with the Strait-Line. Rear-carried bucket load adds needed weight to the rear driving wheels . . . subtracts weight from the front steering wheels. Increased traction plus the new PUSH-TILT bucket with extended loading lips, enables you to get bigger bucket loads. Two levers control all operations.

Add them all up . . . ability to select your type of digging, front or back as the job requires . . . Strait-Line operation with back digging which gives you faster operation, greater traction and easy steering . . . fuller buckets . . . and you'll see where your operations can profit with the Strait-Line. For information and literature, see your Oliver Industrial Distributor or write direct to The OLIVER Corporation, 19300 Euclid Avenue, Cleveland 17, Ohio.



Conventional front digging, primarily used with Strait-Line where unit digs and moves straight ahead to load.

Back digging. Note how extended loading lips easily penetrate the bank.

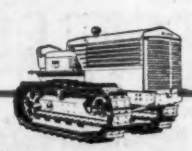
PUSH-TILT action which lifts cutting edge 20" and thrusts it into bank.

Carrying position—bucket is tilted to retain load and is carried low enough to increase both traction and stability.

Dumping position. Bucket has been carried over the roof and dumps in front.

THE OLIVER CORPORATION
A complete line of industrial wheel and crawler tractors

"FINEST IN INDUSTRIAL MACHINERY"



THE OLIVER CORPORATION

The Sign of Extra Service

inches at the center and 10 inches at the sides, the slope taking care of the drainage. This leveling layer is reinforced with 6 x 6 steel mesh. To waterproof the building from the bottom up, five-ply 15-pound felt roofing material was laid on top of the leveling course. Each ply was swabbed on with coal-tar pitch heated in an Aeroil kettle. The roofing paper was continued from the top of the slab on up the sides of the walls to ground level, thereby making the entire basement and subbasement watertight.

Concrete Handling

To prevent this roofing paper from being punctured by reinforcing steel, and thereby completely destroying its effectiveness, a 2-inch course of hot plant-mix bituminous concrete was laid over the waterproofing as protection. The mix was delivered to the site in trucks and unloaded by crane and clamshell which placed it down in the hole. There it was leveled off by hand screeds and rolled by a small 4-ton tandem roller.

On top of this bituminous cover, a 4-foot-thick reinforced-concrete foundation mat was laid next. This layer of concrete was well strengthened by 1-inch and 1¼-inch bars running both ways on 3½-inch centers on two planes, one being 3 inches below the surface and the other 3 inches off the bottom of the concrete. Excavation at the site totaled about 150,000 cubic yards, including backfill.

Concrete for the project, in the amount of 27,000 cubic yards, was batched in a lot only two blocks from the hospital, and discharged into truck mixers which delivered it to the job. The contractor set up his own plant along a siding of the Illinois Central Railroad over which materials were delivered. Sand and gravel aggregate was supplied by Jahncke Service Co. of New Orleans, delivery being made from the vicinity of Baton Rouge. Aggregate was stockpiled and loaded into a Blaw-Knox 40-yard bin. Another Blaw-Knox bin with a capacity of 800 barrels held bulk cement furnished by Lone Star Cement Co. of New Orleans. A Northwest truck crane with a 60-foot boom and a ¾-yard clamshell bucket handled aggregate at the plant.

Truck Mixers Used

A fleet of 6 Jaeger 2-yard truck mixers, mounted on Chevrolets, mixed the concrete en route to the site. Water for the batches came from city hydrants. Maximum-size aggregate is 1½-inch, but batch proportions varied according to the design strength for different parts of the structure. Concrete is used with design compressive strengths of 2,500, 3,000, and 3,750 psi at 28 days. The high-strength concrete is used in the columns. Laclede Steel Co. of St. Louis supplied the 2,000 tons of reinforcing steel for the concrete. It was shipped by rail to the siding and loaded on trailers for the short haul to the site, where a Bay City truck crane unloaded and stored it.

On the foundation pours, both wall and mat, the concrete was discharged into Heltzel 1-yard buckets which were lifted to the forms by cranes. Universal forms for the 30-inch foundation wall, 15 feet high or up to elevation 17.0, consisted of a ½-inch plywood face on a steel frame and backed with 2 x 4 wales on 2-foot average centers. These walls also cut across the building foundation both ways to act as girders. In this way if settlement should tend to occur in any one area, the load would be transferred to piles in other areas so that settlement, if any, would be uniform over the entire building area.

As the concrete was placed, it was vibrated with Viber vibrators. Sand and water were used in the curing. The foundation was poured in sections; one large pour totaling 764 yards was done in 13 consecutive hours of work. Over this heavy mat a 12-inch cushion of gravel was laid before the 6-inch RC slab was poured for the subbasement floor. Columns for the RC framework of the hospital are mostly square, and average 14 x 14 inches for the 10 floors. Steel pan forms for the slabs and joists are furnished by the Southwest Steel Co. of Houston, Texas. When the building reached a height beyond the limits of the cranes, the concrete was delivered to the floor levels by an outside hoist.

Curtain walls between the columns will be face brick backed by tile, from 10½ to 12½ inches thick. Otis elevators will service the hospital. Backfill hauled 10 miles from the Mississippi River batture will provide good material for landscaping the site.

Personnel

Robert E. McKee, general contractor, is represented on the hospital project by M. C. Brown, Superintendent; Ralph Lozano, Office Manager; and Tom O'Melveny, Engineer. Frank Scott is Resident Engineer for the architect representing the Corps of Engineers, U. S. Army, New Orleans District. Charles W. Lahey is Project Engineer, representing the Corps of Engineers.

New Trailing Axles

Latest addition to the Little Giant line of trailing axles for increasing truck capacity is a new heavier model, built for use with 3 to 6-ton trucks by Little Giant Products, Inc., Peoria, Ill.

The Model D trailing axle offers an 18,000-pound capacity suited, the company says, for hauling cranes, shovels, large-sized tractors, and other heavy construction equipment. Its features include a 3½-inch-square axle of heat-treated chrome-nickel steel, 21-leaf springs, hydraulic or air brakes, and wheels interchangeable with the truck.

Little Giant's trailing-axle line for installation behind the rear driving axle of two-axle trucks almost doubles truck capacity, according to the manufacturer. Other models are built for 1½ to 5-ton trucks, with capacities of 11,000, 13,000, and 15,000 pounds. The axle spacing may be either 44 or 49 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 3.

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Make more money
• Save expensive lumber and carpentry labor
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• Use the same forms for a wide variety of work
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WRITE FOR BULLETIN 2259 for complete information—28 pages of detailed illustrations show form set-ups for every type of work with complete instructions on how to use them. You'll find *your* job illustrated—you'll see how to make more money on every job.

HERE'S the fastest, most economical method of forming concrete curb, curb and gutter, integral curb or sidewalks you ever saw! One set of Blaw-Knox Steel Forms handles *every* job from simple straight work to serpentine or curved shapes, without the expensive carpentry that boosts man-hour costs and cuts profits. Easy to set and strip, they get the job finished on schedule and well within your estimate. You can use them repeatedly in combinations to fit every requirement. Costly hand finishing is eliminated and finished jobs have a smooth perfection impossible to achieve with wood forms. Form maintenance is practically non-existent.

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THERE'S A BLAW-KNOX "COMPLETE PACKAGE" FOR *EVERY* CONSTRUCTION NEED

There's everything you need for low-cost construction work in the "Complete Package" of Blaw-Knox equipment—Clamshell and Concrete Buckets, Road Forms, Aggregate and Cement Batching Plants, Central Mixing Plants, Subgraders, Paving Spreaders, Finishing Machines, and a complete Ready-Mix Plant including Truck Mixer Loading Plants and the Hi-Boy Trukmixer with the revolutionary Revolving Hopper. Ask for detailed information.

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STRAIGHT CURB FORMS.
SIDEWALK FORMS.
FLEXIBLE STEEL RADIUS FORMS.
FROM FORMS TO PAVER TO FINISHER... ALL YOUR PAVING EQUIPMENT
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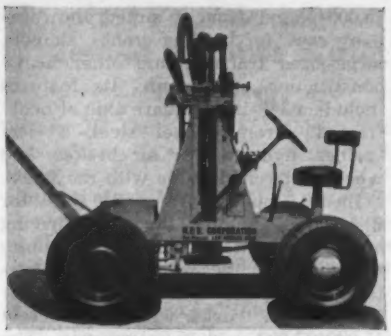


An automatic control on the Mighty Midget Model B pavement breaker eliminates upsurge of the piston against the top head and most of the over-reach on the bottom head.

Pavement Breaking By Machine Methods

A new model of the Mighty Midget Model B pavement breaker is announced by the R.P.B. Corp., 2751 E. 11th St., Los Angeles 23, Calif. It features an automatic control designed to eliminate upsurge of piston against the top head and 95 per cent of the over-reach on the bottom head.

A 200-pound head gives a more effective blow than the previous model, especially in cutting asphalt. The breaker may be self-propelled or towed. It has a conventional automobile rear end, driving on both wheels, which is said to make it a simple matter to keep the machine on line while in action.

The Model B pavement breaker has an automatic attachment, an auxiliary cylinder standing parallel with the main cylinder. As the hammer is put into motion, the auxiliary cylinder automatically controls the length of stroke of the main drive. The new model is equipped with the same type of cylinder and elevating mechanism as the original Mighty Midget. New-type tools are interchangeable with the old machine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 91.

New Line of Trucks

A new line of Golden Anniversary Model A trucks, all completely Mack-built, has been announced by Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y. It ranges in size from 17,000 pounds gross vehicle weight for medium-duty hauling to 40,000 pounds gross combined weight in the tractor semitrailer model for heavy-duty highway work.

Each type of truck was designed with a view to its special use, Mack says. On city-type trucks, special attention is paid to clutches; on over-the-highway models, concentration is on gear ratios and tough frames. Feature claimed for the new Magnadyne engine is that it needs no breaking in. When it leaves the plant, it can be put to immediate heavy work, Mack says.

Wide-area brakes on the new trucks provide quick stops, with rapid dissipation of heat to guard against burnouts. Standard equipment includes a de luxe cab, rear-view mirror, painting in synthetic enamel, electric starting and lighting system, sealed-beam headlights, combination stop and tail light, electric horn, defroster nozzles, speedometer, spare rim, front bumper, and tool kit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 79.

Mild-Steel Welding Rods

A catalog on mild-steel arc-welding electrodes has been prepared by Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y. It contains two pages of data on each of seven Murex electrodes meeting various AWS and ASTM requirements for mild-steel arc-welding electrodes. Information includes descriptive and application data, identifying colors of coatings and tips, standard diameters and lengths, operating procedures, weld-metal analyses, physical properties, and other data useful in choosing and using the proper electrode for mild-steel applications. The catalog is illustrated with performance charts and application photographs.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 2.

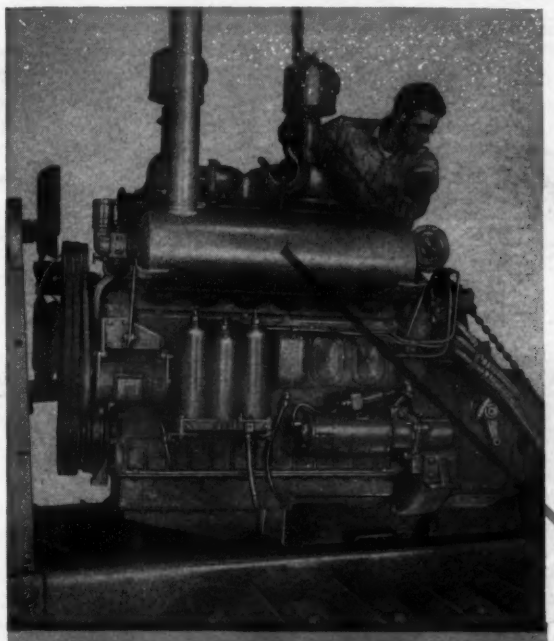
A Wire-Rope Cutter

The new Model W Hydrashear wire-rope cutter has been announced by Pell Cable Cutter Co., 55 New Montgomery St., San Francisco 5, Calif. This hand-powered unit is designed especially for use with cable-controlled equipment, for elevator repair work, or where a portable, lightweight cutter is required.

The Model W weighs 18 pounds and cuts any type and size of wire rope up to and including ¾-inch diameter, according to Pell. It is 12 inches long, 3½ inches wide, and 6 inches high. It is self-contained and requires no outside power or additional tools. Hydrashear cutters are of all-steel construction and can be used in any position and under water, according to the manufacturer.

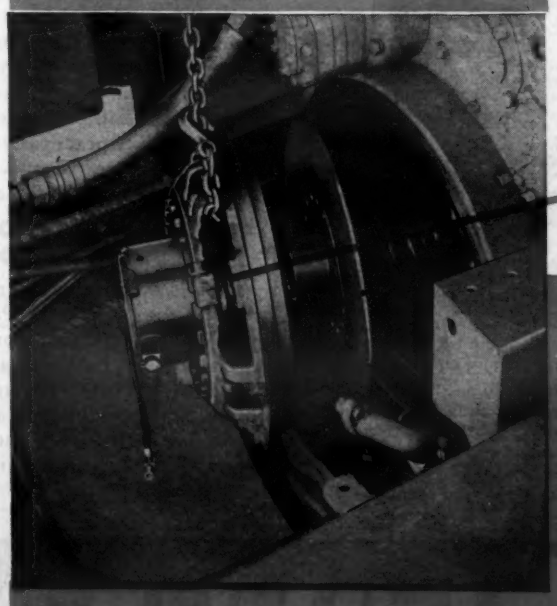
The new Model W Hydrashear cuts up to and including ¾-inch wire rope. It is hand-powered, operates in any position.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 11.



Engine can be removed without disassembling clutch.

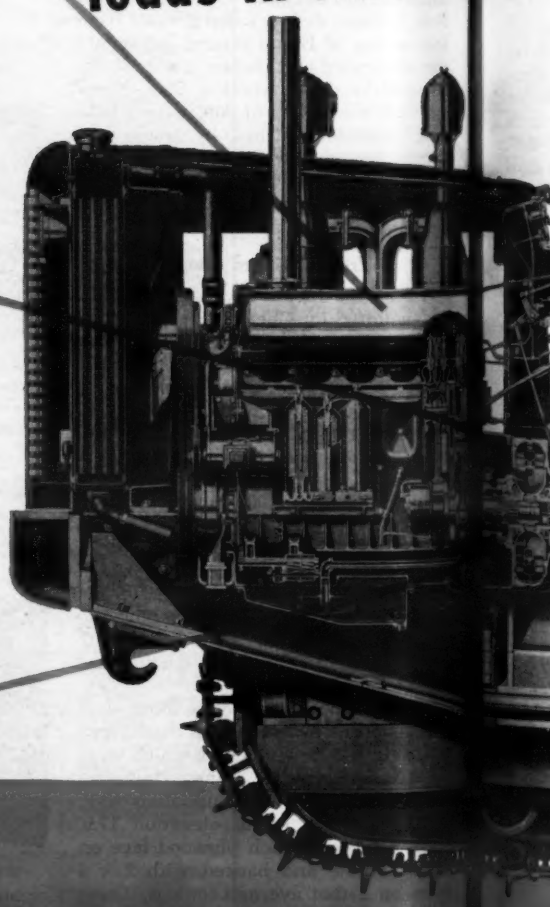
Torque converter can be removed without disturbing engine or transmission.



Clutch assembly can be removed without disturbing either engine or transmission.

Allis-Chalmers Desig

Another big reason why HD-9 leads in tractor put



More Reasons for HD-19 Top Perfo

Torque Converter Drive

40,000 lb. of Balanced Weight

Exclusive Positive Seal 1000-Hour Lubri

Greater Operator Comfort

Two New Compressors For Light-Duty Jobs

Two new Blue Brute portable air compressors have been introduced by Worthington Pump & Machinery Corp., Construction Equipment Division, Holyoke, Mass. Built in two types — a trailer model for general use and a hand-truck model for industrial applications—these two-stage air-cooled compressors have 30-cubic-foot capacities at 100-pound pressure and a maximum operating pressure of 150 pounds. They are designed for roadside spraying, lightweight digging, breaking, tamping, and inflation of large tires.

This new Blue Brute portable air compressor has a 30-cubic-foot capacity at 100-pound pressure. It is also built in a hand-truck model.

Other applications are operating air tools, light blasting and chipping, and powering paint guns.

Powered by air-cooled gasoline engines, the compressors have Worthington's patented feather valve, suction valve unloading, and accessibility for easy maintenance. They are equipped with Air-Maze oil-bath cleaners and standard ASME air receivers (Massachusetts standard at slightly extra cost). A protective all-steel canopy is also available.

The trailer model is 74⅝ inches long and 28 inches wide, and weighs 785 pounds. The hand-truck model is 65½ inches long and 28 inches wide, and weighs 630 pounds; its dimensions make it maneuverable in industrial plants or in buildings under construction where aisle or door space is restricted.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 6.

Wickwire Advances Frizzell

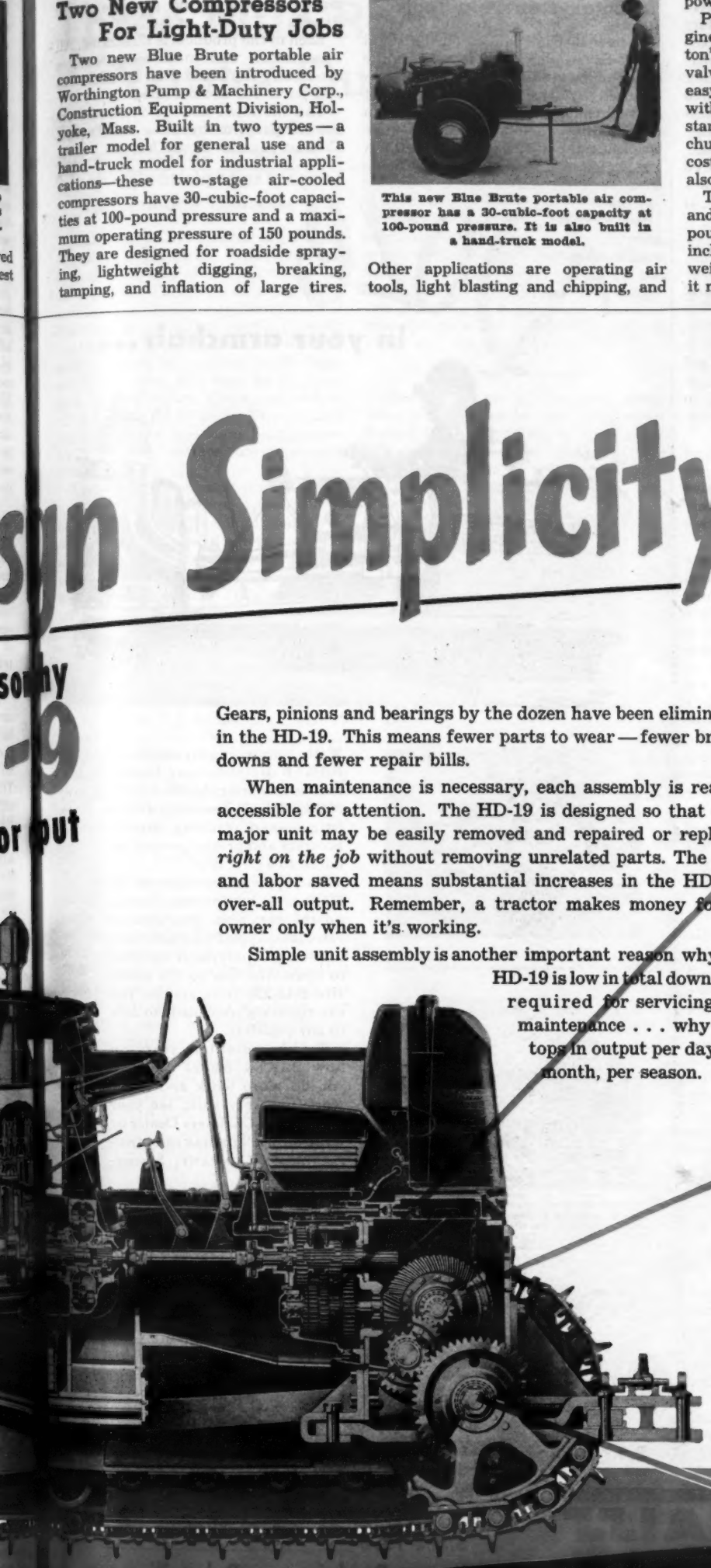
Richard H. Frizzell is now Sales Manager of the Structural Products Department of the Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp. He succeeds G. L. Crawford, now Sales Manager of the Division's Buffalo sales district. Both men have offices in the Wickwire Bldg., 361 Delaware Ave., Buffalo, N. Y.

Simplicity

Gears, pinions and bearings by the dozen have been eliminated in the HD-19. This means fewer parts to wear — fewer breakdowns and fewer repair bills.

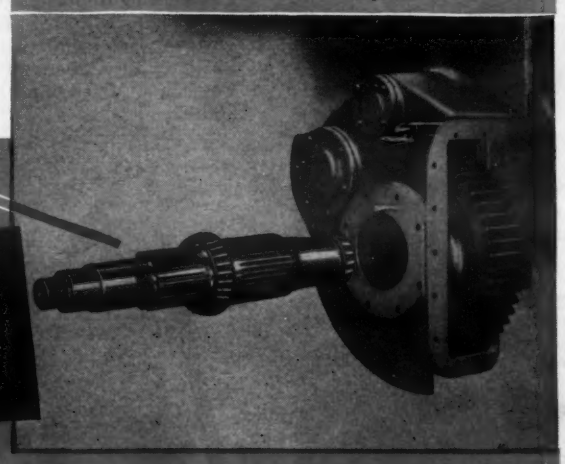
When maintenance is necessary, each assembly is readily accessible for attention. The HD-19 is designed so that each major unit may be easily removed and repaired or replaced *right on the job* without removing unrelated parts. The time and labor saved means substantial increases in the HD-19's over-all output. Remember, a tractor makes money for an owner only when it's working.

Simple unit assembly is another important reason why the HD-19 is low in total down time required for servicing and maintenance . . . why it is tops in output per day, per month, per season.



Transmission can be removed as a complete unit without removing clutch, final drive or bevel gear.

Each steering clutch can be removed independently and without disturbing final drive or bevel gear.



Final drive gear and intermediate gear can be removed without disturbing steering clutch.

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

For Greater Production
For Easier Operation . . . For Simplified Servicing

A pressure primer enables the new Lubrigun to dispense medium and heavy-grade lubricants even at low temperatures.

New Lubricating Gun

A new electric lubricating gun with a pressure primer for dispensing medium and heavy-grade lubricants has been developed by Lincoln Engineering Co., 5702-34 Natural Bridge Ave., St. Louis 20, Mo. The new Lubriguns are designed to provide fast and efficient lubrication of industrial machinery which requires high-pressure application of medium and heavy-grade lubricants that will not readily seek their own level. The manually operated screw-feed pressure primer is spring-loaded to maintain positive and continuous prime even at low temperatures.

Further information may be secured from the company by requesting Bulletin 662. Or use the Request Card at page 16. Circle No. 104.

Controls for Air Tools

A full line of pneumatic control equipment has been announced by the Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif. These new products for use with air-operated tools and machinery are designed to filter, regulate, and lubricate the air to obtain maximum efficiency and minimum operating costs.

The filtering element is made of oilite bronze, said to provide clean air free from dirt, scale, and excessive moisture. The filter can be completely disassembled for cleaning without removing it from the line.

The regulator will provide accurate flows with minimum pressure drop and is of compact and sturdy construction, Victor states. The lubricator in the pneumatic control equipment provides a visible adjustment of oil flow rate by means of a sensitive valve. The oil supply can be replenished while the unit is in operation. Oil cups are available in cadmium-plated drawn steel or transparent plastic.

The new air filter-regulator-lubricator unit is available in ¼ or ⅜-inch pipe sizes and will be available in ½ or ¾-inch sizes at a later date.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

Road-Widening Machine

A folder describing the Model 616 Buckeye Hi-Way widener is available from The Findlay Division, Gar Wood Industries, Inc., Findlay, Ohio. This machine may be used for road widening and cutting curb, gutter, and storm-water carry-offs. It has a maximum digging depth of 18 inches and cutting widths of 24, 30, 36, 42, and 48 inches. The circular illustrates the Buckeye widener in operation on several kinds of work. All construction and operating features with complete specifications are listed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 144.

Asphalt Institute News

In order to cover the Louisiana and Mississippi section of the country more intensively, The Asphalt Institute has appointed William H. Rhodes District Engineering Representative in that area. Mr. Rhodes will assist William H. Mills, District Engineer for the Institute in the states of Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Tennessee.

Catalog on Pipe Tools

A new 15-page catalog on the Rigid Work-Saver pipe tools for use in the construction industry has been announced by The Ridge Tool Co., of Elyria, Ohio. The tools presented in the 4-color booklet include pipe wrenches, threaders, cutters, vises, extractors, reamers, and portable power drives.

Each of the products is illustrated. All construction and mechanical features are clearly explained. Full specifications and parts lists are provided.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 123.

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★ Front Mounting
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Safety link prevents bar breakage
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Accurate, non-clogging, no-streak application guaranteed

Rosco has developed these features, many of which are now universally used. Buy Rosco and be assured of the latest design advantages.

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ROSCO MAINTENANCE UNIT
For repair and secondary construction. Both truck and trailer mounted units are available.

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Direct lift and positive down-pressure are two of many features of the engine-mounted twin cylinder design in the new Baker HD-5 blades.

The open design of the mounting brackets on either side of the engine frame makes your tractor engine *easily accessible* for inspection and adjustment.

With a new *engine-mounted* BAKER Bulldozer or Gradebuilder on your ALLIS-CHALMERS HD-5 Tractor, driver fatigue—and resulting loss in accuracy and production—is reduced to a new low.

The operator can control the blade with his forearm resting on the seat arm. The control valve is equipped with ball bearings—needs only *finger-tip* effort to shift. And due to the exclusive BAKER valve system, you can count on your blade to *hold* in any position.

For the complete story on how BAKER blades can help you do more work and better work on every shift, see your Baker-Allis-Chalmers Dealer or write direct. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.

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Three-Mile Road Job Yanks Out 10 Curves

Relocated Connecticut Road Has a Macadam Base and a 2-Inch Wearing Surface of Bituminous Concrete

+ LAST year the Connecticut State Highway Department reconstructed a hazardous stretch of State Route 2, the New London Turnpike, between Glastonbury and Marlborough, southeast of Hartford. A relocation contract nearly 3 miles long eliminated ten curves that were part of the original road alignment. The work was done by D. Arrigoni, a Middletown, Conn., contractor, on a low bid of $535,204. The finished highway has a macadam base topped by a wearing surface of bituminous concrete.

The old road was narrow with an 18-foot concrete pavement and shoulders only 4 feet wide. The improvement is on new location except where it crosses the original highway at four different places, and at the ends where it ties in to the old pavement. The new pavement is 24 feet wide with a center crown of ¼ inch to the foot. It is flanked by 8-foot shoulders sloping at the rate of ¼ inch to the foot. A gravel subbase under the pavement extends out through the shoulders. On fills the gravel course is 8 inches thick, and 12 inches in cuts. In fills up to 4 feet in height, the slopes are 4 to 1, in 4 to 8-foot fills the slopes are 6 to 1; while over 8 feet the fill slopes are 2 to 1. In earth cuts the slopes are 2 to 1, while in rock the slopes are 1 to 2.

Earth Work

Grading items included 200,000 cubic yards of earth excavation, with 46,000 yards of borrow necessary to balance out the quantities. Though 90,000 yards of rock was estimated, only around 75,000 yards was actually excavated from the roadway. The deepest rock cut was 30 feet, while the maximum cut and fill in earth was 40 feet. The 30-foot rock cut, composed mostly of mica schist interspersed with some very hard granite, was taken down in two lifts. Vertical blast holes were drilled on an average of 4-foot centers both ways, but snakeholes were also required at frequent intervals to break through the schist and lift it.

Drilling equipment included one Worthington and three Ingersoll-Rand wagon drills which were powered by five air compressors—four I-R's at 315 cfm and one Joy unit at 650 cfm. A couple of jackhammers driven by a 110-cfm compressor saw limited service in trimming off the high spots. Drill steel 1¼ inches in diameter was used with the wagon drills in lengths of 4, 8, 12, and 16 feet. The holes were made with I-R bits, starting with 2⅝-inch size. Standard bits were employed in the schist, but on the hard granite the Carboloy type were used to better advantage. Drill holes were charged with both Hercules and Du Pont dynamite—40 per cent strength in the schist and 60 per cent in the granite.

Excavation was handled by two Bucyrus-Erie 1½-yard shovels—a 37-B and a 38-B. Other rigs on the job included a Bucyrus-Erie 22-B ¾-yard shovel on drainage work; a Lima ¾-yard shovel on drainage and gravel-subbase work; and a Koehring 1½-yard crane with a 60-foot boom on drainage and culvert construction. Most of the dirt and rock was moved by trucks—two Sterlings at 6 yards and fourteen Internationals, of which two held 7 yards and the rest 5 yards.

Gravel Subbase

Short hauls on the roadway earth work was handled by two LeTourneau 9-yard Carryalls pulled by Caterpillar D7 tractors. Borrow material was

(*Continued on next page*)

C. & E. M. Photo

A Koehring 605 crane with 60-foot boom and a ¾-yard Owen clamshell loads a Sterling truck with material from a culvert excavation on the Connecticut relocation job.

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SELL used equipment
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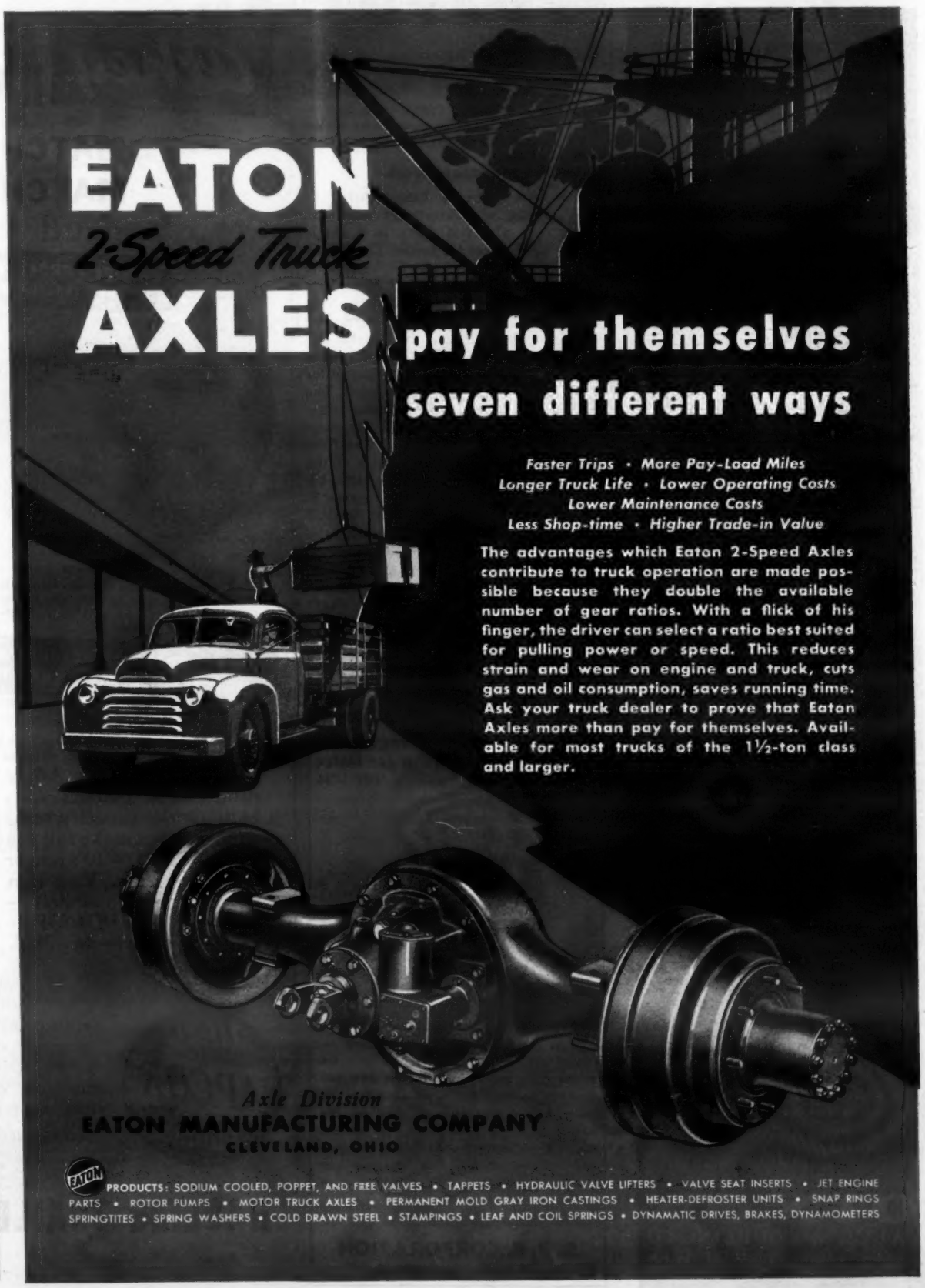
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The advantages which Eaton 2-Speed Axles contribute to truck operation are made possible because they double the available number of gear ratios. With a flick of his finger, the driver can select a ratio best suited for pulling power or speed. This reduces strain and wear on engine and truck, cuts gas and oil consumption, saves running time. Ask your truck dealer to prove that Eaton Axles more than pay for themselves. Available for most trucks of the 1½-ton class and larger.
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Three-Mile Road Job Yanks Out 10 Curves

(*Continued from preceding page*)

hauled by trucks from pits which were opened up close to the road and near the west end of the job. The average haul was just under a mile. Three dozers—a D8, a D6, and an International TD-18—spread the material.

The gravel subbase material was also obtained from roadside pits and hauled in trucks. It was spread in 6-inch lifts by the dozers, and compacted in the process, with the final shaping done by a pair of Caterpillar No. 12 motor graders. Two Buffalo-Springfield 3-wheel rollers, a 10 and a 15-ton unit, were on the job for rolling the subgrade, the subbase, and the macadam base course.

On top of the gravel subbase, a 3-inch course of traprock was laid the full width of the pavement. The 2-inch stone was purchased from the York Hill Trap Rock Co. of Meriden, Conn., 28 miles from the job, with the contractor using his own trucks for the delivery. It was laid in a single course by Nickerson and Burch spreader boxes. The interstices were then filled in with sand, obtained locally and put on with a rotary-type spreader. The base course was next wet down by a 1,000-gallon tank truck having a gravity spraybar at the rear. Water was pumped to the truck from a creek by a Rex 4-inch pump. Then the stone was rolled by the 3-wheel rollers.

C. & E. M. Photo
Meet (left to right) Tony Arrigoni, Superintendent Adam Adamoli, and Ferdinand Arrigoni of the D. Arrigoni contracting firm.

Macadam Work

Over the traprock base went a 3-inch course of bituminous macadam which was also put down in a single lift with the spreader boxes. The 2-inch stone that was used was first rolled to grade, then given a shot of 85 to 100-penetration asphalt applied at the rate of 1¾ gallons to the square yard. The shooting was done by the Mystic Bituminous Co. of Portland, Conn., using an Etnyre 1,250-gallon distributor mounted on an International truck. The Standard Oil Co. of New Jersey supplied the bitumen, shipping it from Bayonne, N. J., to a siding of the New Haven Railroad within 15 miles of the job site. It was applied half width at a time at a temperature of 350 degrees F.

The penetrated course was chinked with ¾-inch traprock put on with the rotary spreader, and rolled with the 3-wheel rollers. Later, a steel-bristle broom drag was pulled over the surface to spread out any stone that was still loose. The macadam course was then given a seal coat consisting of a penetration of ¼ gallon to the square yard with 85-100 asphalt which was covered with ½-inch stone and rolled in. Loose stone was swept off by a rotary broom hooked to the front end of a truck before the bituminous-concrete wearing course was put down.

The bituminous-concrete work was sublet to the Kessler Construction Co. of West Hartford, Conn., which purchased the plant-mix from Arborio & Sons of Farmington, Conn. The mix was hauled 16 miles to the job in trucks, and laid by a Barber-Greene Finisher in lanes half the pavement width. It was compacted by two Galion tandem rollers of 8 and 12-ton size. The plant-mix was laid in a single 2-inch course.

Stabilized Shoulders

The 8-foot shoulders are stabilized with asphalt to a depth of 8 inches. A shot of MC-3 was first applied at the rate of 0.4 gallon to the square yard at 250 degrees F. This was worked in by a Rototiller, and was followed with a second application of MC-3 at the same

(*Concluded on next page*)

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Washer type female coupling
Style W-16

Users of this long-time leader in the Dixon line represent a roster of American industry. Its quality and design distinguish it from others frequently yet improperly classified as "Boss type couplings."

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BREAKS CONCRETE FASTER

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THE NEW, MORE POWERFUL

MIGHTY "B" MIDGET

Stronger construction, greater hitting force, increased mobility and easier operation are a few of the many improvements of this great new pavement breaker. Actual performance records under the toughest conditions show that this machine has a capacity of breaking 12" concrete. Operates on either 105 or 160 C.F.M. Compressor. Conventional Automotive rear end drive —equipped with 7.10 x 15 tires—manual or automatically operated.

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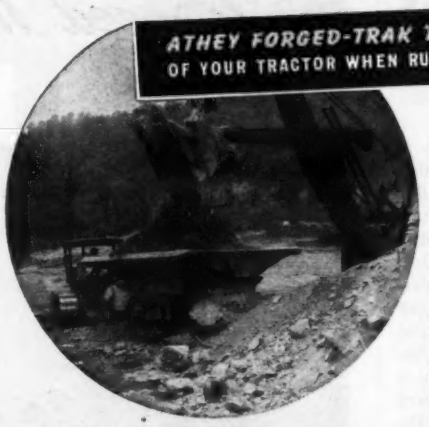
ATHEY FORGED-TRAK TRAILERS... MATCH THE POWER OF YOUR TRACTOR WHEN RUGGED CONDITIONS CALL FOR TRACKS!



▶ Here's *your* hauling tool for handling *your* jobs in tough terrain. Broad tracks lay a road for the load . . . take the trailer anywhere the tractor can go. There's a model to match the drawbar power and earning capacity of your track-type tractors.

H. R. Anderson Co., Garden Ground, W. Va., hauls overburden over cross-country trails with an Athey Forged-Trak Quarry Trailer.

ATHEY PD10Q OR PD10GP TRAILERS MATCH THE POWER AND SPEED OF THE "CAT" DW10 WHEN YOUR HAULS ARE LONG AND FAST

▶ For long-distance, high-speed hauling, it's Athey rubber-tired haulers . . . built with capacity and endurance to make full use of the "Cat" DW10's power and fleetness. You can choose from two models — The PD10Q or PD10GP — to fit materials handled.

C. A. Pitts Constr. Co., Mattawa, Ont., puts wings on rock-hauling with an Athey PD10Q Trailer.

▶ 25 years of experience are behind Athey Trailers. Design, construction and profit-producing ability have been proved by users everywhere. Call or visit your Athey-"Caterpillar" Dealer. He can tell you how you can get in on the profits of these matched haulers.

Athey APCOR Products

ATHEY PRODUCTS CORPORATION, 5631 W. 65th St., Chicago 38, Illinois

HAULING TRAILERS Athey

rate. Motor graders shaped and sloped the shoulders which were then rolled by the 3-wheel rollers.

Quantities and Personnel

The major items in this highway relocation contract included:

Earth excavation	200,000 cu. yds.
Rock excavation	90,000 cu. yds.
Borrow excavation	46,000 cu. yds.
Subbase gravel	30,600 cu. yds.
Broken stone	15,500 tons
Bituminous concrete	4,500 tons
MC-3 asphalt for shoulders	45,000 gals.
Asphalt (macadam), 85-100 penetration	80,000 gals.
Gravel shoulders	8,000 cu. yds.
Mixing bituminous stabilized shoulders	26,000 sq. yds.
Perforated underdrain, 6-inch	5,000 lin. ft.

D. Arrigoni, the general contractor, employed an average force of 35 on the project under the supervision of brothers Tony and Ferdinand Arrigoni of the firm, and Adam Adamoli, Superintendent. Another brother, Charles, operates a commercial concrete plant of the firm at Durham, Conn.

The Connecticut State Highway Department was represented by George Pavelka, Project Engineer. The Department is headed by G. Albert Hill, State Highway Commissioner. Roy E. Jorgensen is Deputy Commissioner and Chief Engineer.

Regular purchase of U. S. Savings Bonds means personal security as well as a share in the national security.

For Rapid Print-Making And Processing Equipment

A check list of print-making processes and their features is included in the new 32-page catalog issued by Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y. It compares blueprints, diazo prints, and reproduced tracings, and it explains cost influences in processing work.

Principal products covered are the Revolte M-4 automatic blueprinting machine for large-volume production on a continuous yardage; the Comet automatic diazo printer and finisher for large-volume production of dry diazo prints; and the Rocket combination printer and finisher for medium-volume production of dry diazo prints. Other products include the Nos. 4 and 5 printers, the Jumbo drier for production drying of sheet stock, and washing and developing trays. Each machine is illustrated, and all its construction and operation features are fully described. The catalog also points out that the M-4 automatic blueprint machine can be arranged to process the new Kodak Autopositive paper on a continuous-yardage basis.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 73.

ANOTHER ROLLER CHAIN ENGINEERING ADVANCE FOR SEVERE SERVICE

Patented Bushed Center Plate Connector for Diamond Multiple Strand Roller Chain

U. S. Patent 2,466,639 April 5, 1949

The file-hard bushings resist wear, add life.

• Diamond Chain pioneered the use of press fit center plate construction for Multiple Strand Roller Chain for severe service applications some years ago.

Now Diamond Chain offers a Connector for these chains which provides durability closely matching that of chain with press fit center plate construction and ease of assembly and disassembly equal to that of slip fit center plate design.

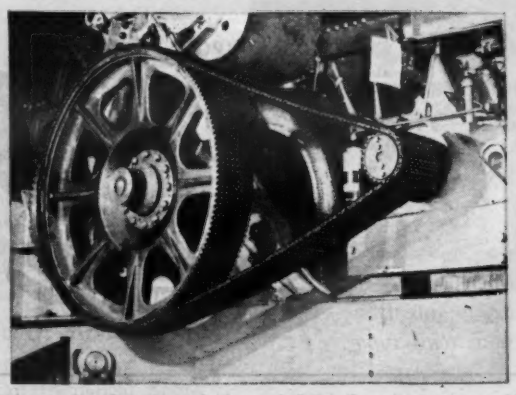
File hard bushings are pressed into pitch holes of pairs of center plates making one unit; the bushings then being ground for hole and pitch accuracy. Wear is greatly reduced, thus assuring full support of the pins at the connector across all strands throughout the long service life of the chain.

If you have a problem where the duty or service is heavy, you can benefit through this Diamond engineering development. Our staff of experienced engineers can help you with practical recommendations.

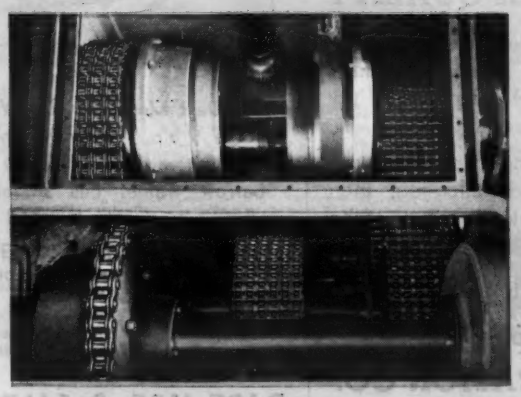
This shows the pairs of bushed center plates through which connecting link pins pass.

DIAMOND CHAIN COMPANY, Inc.
Dept. 487, 402 Kentucky Ave., Indianapolis 7, Ind.
Offices and Distributors in All Principal Cities
Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS



For Heavy Duty jobs, multiple-strand Diamond Roller Chain with new Connecting Links add extra life and reduce costs.



Puerto Rico Builds Modern Air Terminal

With commercial and tourist traffic becoming increasingly heavy at the Isla Grande Airport in midtown San Juan, the Puerto Rico Transportation Authority has begun preliminary work on a new International Air Terminal at Isla Verde, 20 minutes outside the city. It will take at least 3 years to complete, at a cost of $12,000,000, and will make Puerto Rico the air hub of the Caribbean.

The site of the new terminal borders the Atlantic Ocean just east of San Juan. A right-of-way has been acquired for a highway into the city. At present a fleet of Euclids is handling 2,000,000 yards of fill for the 482-acre site. Contractors have $1,500,000 worth of heavy-construction equipment on the scene for the job of filling, draining, and grading. When that part of the work is completed this year, the level of the land will have been raised an average of 8 feet. Afterwards, work on the landing strips, ramps, and other installations will be started.

Euclids, each carrying a payload of 10 cubic yards, move across the new International Air Terminal at Isla Verde, Puerto Rico.

Runways will be 8,000 feet long to handle the largest type of passenger planes at the rate of 40 to 50 per hour, or about 1,000 landings daily. The landing field is to be built of flexible pavement with 500-foot approaches, while taxiways and aprons will be mostly of reinforced concrete. All buildings will follow a horseshoe pattern, with the administration building centrally located. In addition to the necessary passenger and freight buildings, plans call for residential quarters for CAA operating personnel.

Hydraulic Truck Hoists

A circular describing Burch Models 306 and 307 hydraulic hoists has been prepared by The Burch Corp., of Crestline, Ohio. Designed for installation on medium-duty trucks, the hoists feature self-sealing oil seals, two 3/16-inch alloy piston rods, a 60-degree dumping angle, and a Full-flo roller-bearing pump.

Complete specifications are given, along with a photo of the hoist and a cutaway illustration of the pump. On the reverse side of the circular are drawings of Burch dump bodies.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 126.

Concrete-Form Accessories

A 4-page folder outlining concrete-form accessories made by Universal Form Clamp Co., 1238 N. Kostner, Chicago 51, Ill., is now available. It illustrates form ties, bar supports, and building specialties; and it highlights the Spiroloc assemblies for tying and spreading concrete forms. The products are illustrated and described.

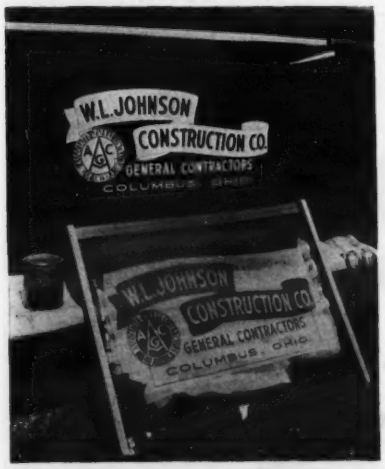
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 125.

There Is No Substitute for Quality

You are always sure of the finest quality equipment identification with a genuine FLEXO-SCREEN.

And so easy to apply, too—no experience or skill necessary.

Fits door curves and flat surfaces with equal perfection.



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Hundreds of applications of fine yet durable lettering in raised enamel that defies the elements. Will not crack, chip, peel or fade.

If you are economy-minded, yet like the finest identification, then you will appreciate the merits of the FLEXO-SCREEN.

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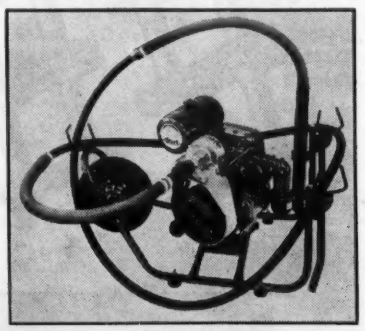
High Speed Concrete

VIBRATORS



The Dart Model 500CW

The Dart Model 500CW Vibrator has a 5 h.p. Wisconsin air-cooled gasoline engine with handy wheelbarrow frame. Full swivel base allows vibrator to be used in any position. Sturdy, lightweight 20-foot cable facilitates one-man operation.

See Dart Gasoline and Electric models at your Dealers or write for free literature.

DART MFG. & SALES CO.
1246 Champa St. Denver, Colorado

YOU CAN BE SURE OF UNIFORM *Quality* IN BRIGGS & STRATTON ENGINES

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Milwaukee 1, Wis., U. S. A.

World Wide FACTORY SUPERVISED SERVICE

Preferred Power FOR INDUSTRIAL CONSTRUCTION RAILROAD AND FARM EQUIPMENT

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

The board of the Stacor drawing table can be raised from a height of 32 to 42 inches and adjusted to any angle from horizontal to vertical position.

New Drawing Table

A new fingertip-adjustment drawing table with an all-steel base has been announced by the Stacor Equipment Corp., 1887-1893 Atlantic Ave., Brooklyn 33, N. Y. The board may be raised from a height of 32 to 42 inches and adjusted to any angle from horizontal to vertical position. The underbody features drawer space for bottles, pencils, papers, drafting tools, etc. The table has a hard-baked grey enamel finish and is made in sizes 24 x 30, 24 x 36, 31 x 42, and 36 x 48. A selected soft-wood top is used for the drafting board.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 53.

Aluminum Safety Hat

High impact resistance is built into the new 12-ounce aluminum-alloy safety hat manufactured by E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif. Laboratory drop tests, the company says, demonstrate that the distinctive ribbed design furnishes ample structural strength, while the crown remains resilient to absorb much of the impact of a falling object.

The Hard Boiled hat incorporates a second impact-absorbing feature. The inner hat assembly is designed to absorb shock with its full-floating six-point suspension hammock. Headbands and hammocks are adjustable to fit all head shapes and sizes. The entire assembly can be replaced without tools with slide-action wedge-type fasteners. The crown is the color of natural aluminum with a nonglare finish.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 25.

Stud-Welding Applications

Eleven different construction applications of stud welding are illustrated and described in a new 4-page folder issued by the Nelson Stud Welding Division of Morton Gregory Corp., Lorain, Ohio. The uses shown include installation of roofing, siding, windows, decorative panels, and electrical equipment; and the securing of insulating materials and reinforcement for concrete and Gunite applications.

Short-form specifications for many roofing and siding materials are also offered—corrugated aluminum, corrugated steel, asbestos-cement-covered structural insulation board, corrugated asbestos-cement sheets, corrugated protected metal, and steel decking.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 149.

Rothermund at Slocum

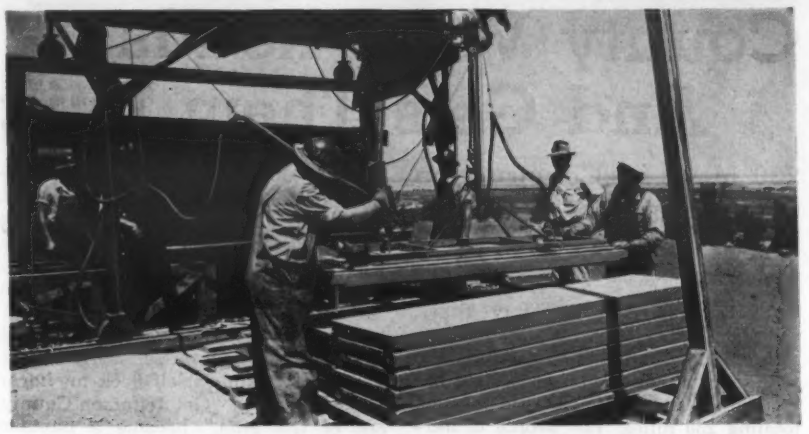
Theodore K. Rothermund has joined W. W. Slocum & Co., Industrial Engineers, of Newark, N. J., as Chief Engineer of its Engineering Division. He is in charge of engineering design and the construction of industrial projects. Mr. Rothermund was previously manager for the H. K. Ferguson Co. in South America.

Folder on Concrete Buckets

Concrete placing on big jobs is the theme of a new catalog offered by Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles, Calif. Concrete buckets in twenty different models and ranging in capacity from ⅓ to 8 cubic yards are described.

The catalog points out such features as the double-clamshell gate design, self-closing spring-operated gates, discharge by remote control, and center discharge for accurate placing. Two attachments are shown, the accordian-type collection hopper and the suspended steel subhopper with elephant trunk. Complete bucket dimensions and full specifications are given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 120.



THE VACUUM LIFTER STACKING CONCRETE SLABS. VACUUM CONCRETE PRECASTING LOWERS CONSTRUCTION COSTS.
WRITE FOR INFORMATION AND LITERATURE.

VACUUM CONCRETE, INC. 4210 SANSOM STREET PHILADELPHIA 4, PA.

HUNGRY HORSE DAM FED BY "U.S." BELTING

Nearly 6 million tons of sand and gravel will be carried to site of mammoth job in Northwestern Montana—on U. S. Rubber Belting

NEARLY THREE MILES of U. S. Rubber Conveyor Belting, varying in width from 24″ to 42″, is used in all the phases of aggregate processing at the Hungry Horse Dam. Above is shown a series of the belts carrying sized materials to the storage piles.

UNITED STATES RUBBER ENGINEERS worked with the constructors of the dam and the designers of conveyor equipment to produce this highly efficient conveyor system. ALL the belting used to "feed" Hungry Horse was furnished by U. S. Rubber.

A FEW OF GIANT crates in which belts were shipped give an idea of the tremendous footage of belting—over 15,000 feet—used at Hungry Horse, country's third largest concrete dam when completed. It is being built for the U. S. Bureau of Reclamation.

Whenever you have a problem involving materials handling, no matter how big or small, get in touch with our engineers. They will gladly cooperate with your own men in working out a solution. Write to:

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MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

County Votes Roads And Gets Them Built

230 Miles of Construction Created by Big Bond Issue as Jefferson County Builds Badly Needed Road System

✦ THEY call Jefferson County, Texas, the state's Mr. Plutocrat. Enviously.

For Jefferson County is pulling the string on a bag of tricks which has created a new county road system totaling 230 miles. The people of Jefferson County deserve major credit for they voted a $6,000,000 bond issue in 1947 which made the transformation possible.

To Jefferson County's people we can add County Commissioners Dick Scurlock, T. B. Ellison, Gale Hatch, and Frank Helmke. Don't forget County Judge James A. Kirkland. County Engineer Charles L. Davidson and his competent engineering staff deserve a lot of credit, too. So do Texas and Louisiana contractors who battled unfavorable soils and high rainfall to build all those needed miles.

It's a story engineers say should be repeated in many a county in these United States, because it's so typical of how county roads are conceived and built.

To start with, the people of Jefferson County weren't highway boosters. Over the years they turned down many a bond issue. To make matters worse, the state's heaviest rainfall is in Jefferson County—55 inches—and some of the state's poorest road-building soils. The soil is predominantly heavy clay, classified agriculturally as Lake Charles clay, with areas of silty clay loam, Lomalto fine sand, marsh, mud beach, Lake Charles find sand, to name a few. Do they sound like base materials? Even sandy loam topsoil is very scarce.

Naturally the highway system got worse and worse until, in 1947, Jefferson County found itself back to horse and buggy days. "Get Jefferson County out of the mud," became a popular slogan. They weren't kidding. Some of the county roads were so bad that they actually looked the way they sound when some state highway men and engineers from the BPR use the term.

So they drummed up a list of the most critical roads that needed construction or reconstruction. The bill, based on 1945 prices, came to about $6,000,000 for the county's share. Counting state and Federal participation, nearly $15,000,000 was represented in this first 230-mile program.

They put it up to a vote of the people. The people slapped it down. They let a month or two go by and tried it again. The people rejected it even more soundly. A newspaper ran a cartoon showing a dazed county commissioner trying to wake up after being hit by a brickbat labeled "Rejection of road program".

It looked as if Jefferson County didn't want roads. But a section of the county which had always been more favorably disposed started to organize a special road district and build its own highways. That eventually led to the creation of a 32-man Citizens Committee, which made a layman's study of the road picture and even planned a program.

Photo Courtesy of County Engineer C. L. Davidson
A Koehring paver pours concrete for a new highway in Jefferson County, Texas.

"It was a good program, too," County Engineer Davidson will tell you now. "I doubt if 32 engineers getting together would have done a better job."

These 32 men got so interested in roads after they had found out a few of the answers that they resubmitted the bond issue for a third vote. This time the Citizens Committee disseminated the facts. It was the same information that had been offered before, but this time Jefferson County passed

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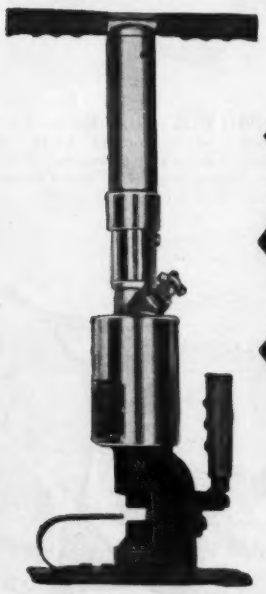
ON-THE-JOB CUTTING OF REINFORCING ROD Made Easy!



Model 20-A Integral Hand Pump

PORTABLE, HYDRAULIC

CUTS ¾" REINFORCING ROD

CUTS 1" LOG CHAIN

WEIGHS ONLY 45 LBS.

NEW MANCO "GUILLOTINE"®

Big-capacity, self-contained portable hydraulic cutter with "C" frame open anvil. Also cuts chain and steel rod, as well as square and hex-shaped material. Other models to cut wire rope, cable.

Easy hydraulic hand pump action (similar to bicycle pump). Operator uses his weight, not his strength, to make cut. Positive automatic blade retraction.

Latest type oil seals positively prevent leakage at both maximum pressure and no pressure. Safety-relief valve prevents overloading.

Model 20-D Compressed Air Hydraulic Pump

AVAILABLE WITH COMPRESSED AIR PUMP 200 CUTS PER HOUR

Press pedal for automatic cutting. Air hydraulic pump assembly operates off any source of compressed air supplying 100 lbs. pressure. Uses 16 cubic feet per minute.

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Several good territories available on Manco Guillotine line. Please give complete statement of qualifications when writing.

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Please send me complete information and prices on The Manco Guillotine.
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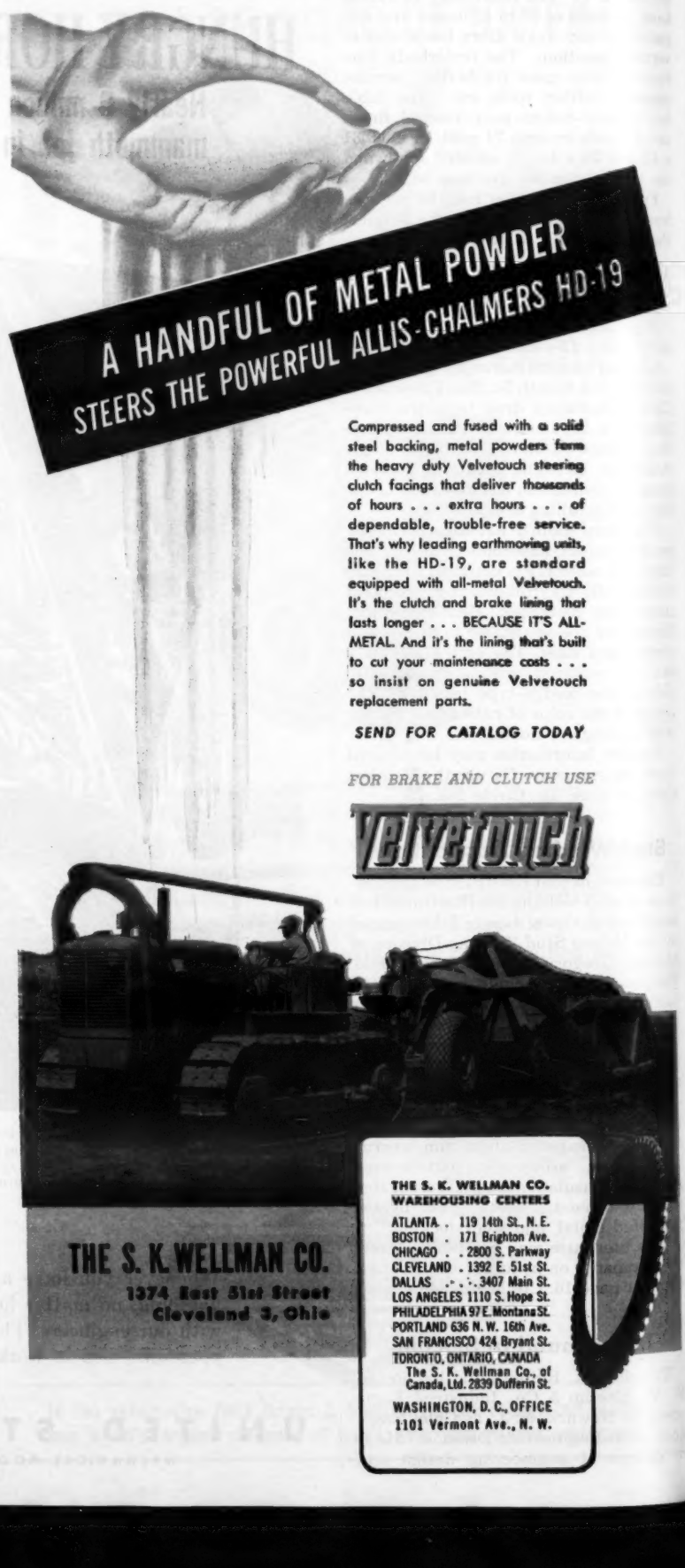

Compressed and fused with a solid steel backing, metal powders form the heavy duty Velvetouch steering clutch facings that deliver thousands of hours . . . extra hours . . . of dependable, trouble-free service. That's why leading earthmoving units, like the HD-19, are standard equipped with all-metal Velvetouch. It's the clutch and brake lining that lasts longer . . . BECAUSE IT'S ALL-METAL. And it's the lining that's built to cut your maintenance costs . . . so insist on genuine Velvetouch replacement parts.

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WASHINGTON, D. C., OFFICE
1101 Vermont Ave., N. W.

C. & E. M. Photo
Charles L. Davidson, County Engineer of Jefferson County, Texas, takes a phone call at his desk in the Courthouse Building in Beaumont.

the bond issue by an overwhelming 7 to 1 vote!

A highway system was born.

Engineering Staff Hired

That's where County Engineer Charles L. Davidson comes into this picture. The Board of County Commissioners picked Davidson, who had been with the Texas Highway Department for years, and gave him a free hand and orders to get some new roads built immediately, if not sooner.

Through friendships and past experience, Davidson was able to hire a top-notch county engineering staff and set up an engineering department practically from scratch. He soon weeded the staff to about 17 people, who have to work at top speed to stay ahead with investigations, plans, supervision, and so on. It has been a year-round job.

"Standards Be Damned?"

Having voted the money and hired an engineering department, the people of Jefferson County now had one main thought. With all due respect to John Q. Public, every citizen in that southeast Texas subdivision wanted a brand-new all-weather county highway built past his door by tomorrow morning. In every case, his road was the most important.

Davidson can't blame a single one, either.

"One fellow came into the office and asked, very courteously, when his road would be built. He explained that he had voted for roads twice before, and each time the county ran out of money before it got to his place. This time . . ."

Davidson explained that a certain amount of money had been appropriated for his road, and assured him that work would get under way in the middle of the summer. He had a constant stream of callers.

Davidson also had one of the worst conflicts of his life. On the one hand, people demanded road construction, fast. On the other hand, Davidson knew that the money should be spent wisely, and that called for exploration work, for surveys, and for adequate plans to assure value received for the expenditures.

By working long after hours, and pushing himself so hard he wound up on an operating table in the local hospital, Davidson got both, after a fashion. But it had to be a compromise. Speed was necessary, so as much exploration work as could humanly be done by the small engineering staff was geared to a series of active contracts. In a matter of a week or so the dirt was flying.

Clearly and concisely, Davidson set forth in a letter to the Citizen's Advisory Committee several points which showed that while speed would be maintained, standards wouldn't "be damned", as one farmer suggested.

He asked that the court adopt minimum standards calling for a 70-foot right-of-way and a 24-foot crown to hold the roadway.

He asked that all funds allocated for improvement of all-weather roads be estimated on the basis of using material which was resistant to traffic abrasion and weather.

He advised against asphalt surfaces in the bond improvement unless a minimum subbase thickness and sections were established and specified. In other words, Davidson didn't want to waste money by applying asphalt surfaces until reasonably adequate bases were built to hold them.

C. & E. M. Photo
You can't build a fill without compaction, even on a county job. So here a Case-drawn Tampo roller gets it done on a Jefferson County, Texas, contract.

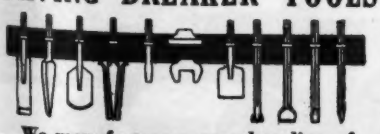
In this letter he pointed out the universal tendency to spread available money over too many miles of road. "This is false economy," he said, "because the costs of maintenance and reconstruction over a period of years will greatly exceed the initial cost of an adequately planned road improvement."

Davidson went on with a few of the facts of life as they apply to road building. He wanted a type of road improvement which would provide for

(Continued on next page)

"BICKNELL BETTER BUILT"

PAVING BREAKER TOOLS



We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.

Write for descriptive circular

BICKNELL MANUFACTURING CO.

12 LIME STREET ROCKLAND, MAINE

4 questions every dump truck user should ask about new International 6-wheelers

QUESTION: "I hear new Internationals are heavy-duty engineered. What does that mean to me?"

ANSWER: "Heavy-duty engineered" means that extra stamina and durability are built into every one of the thousands of parts that go into new International 6-wheel Trucks. This gives you the long life and savings in operation and maintenance that have kept Internationals first in heavy-duty truck sales for 18 years.

QUESTION: "What other assurance do I have that new International 6-wheelers will do a good job on *my* particular job?"

ANSWER: From new valve-in-head engine to new bogie assembly, every new International 6-wheel Truck is *specialized* for years and years of outstanding 6-wheel truck performance. In addition, every model has been *proved* right from every standpoint in actual 6-wheeler operation.

QUESTION: "What do new Internationals offer in the way of new advancements?"

ANSWER: You get the new Comfo-Vision Cab—"roomiest cab on the road." You get the new third differential that eliminates the need for an extra propeller shaft and a power divider, thereby reducing truck weight. You get new Super-steering and new Super-maneuverability for easier handling and turns in the shortest practical circle. You get a new valve-in-head engine, new frame, new improvements from bumper to tail light.

QUESTION: "Where can I find out *more* about how new International 6-wheel Trucks will cut my hauling costs?"

ANSWER: Get in touch with your nearest International Truck Dealer or Branch. He'll gladly give you facts and figures on the right 6-wheel model for you.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors...Motor Trucks Industrial Power...Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars," NBC, Sunday afternoons

ALL NEW, ALL PROVED

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

C. & E. M. Photo
On the Farnsworth & Chambers contract in Jefferson County, a Case-drawn Seaman Pulvi-Mixer blends subgrade earth with clam shells.

County Votes Roads And Gets Them Built

(Continued from preceding page)

later bolstering, or stage construction, *without the loss of the initial investment.*

He said that more money should be spent to improve roadway drainage, provide adequate shoulders and a roadway slope, cross-drainage structures, lateral drainage, and runoff facilities. These are old truths to a road builder. Davidson did his best to pass them on. Some of the information stuck.

He studied the traffic pattern. He soon realized that the minute he improved a rural road it would draw heavy loads for miles around, particularly in wet weather. As the volume and weight of traffic increased, he saw that it would become necessary for additional thicknesses of base material to be placed to carry the loads.

"The problem is to spend the money in the original 'all-weather' investment in a manner so that the loss in investment over a period of years will be cut to a minimum," he advised. "Otherwise, when additional material is added, it will only replace the original quantity."

On its face, this looked like sound theory. But it had to be compromised, at least to some extent. The 1945 prices on which the jobs had been based had gone up, in some cases as much as 25 per cent. The people felt that the money allotments originally made should stand. They did, but it resulted in a few short cuts Davidson would rather have avoided if the budget had allowed it.

Contractors Get Busy

One by one the most important jobs were placed under contract. There were portland-cement concrete slabs, some street-widening projects, miles and miles of single and double-penetration asphalt surfacing on top of a select sand-shell base, and all-weather roads built of unsurfaced sand-shell mixtures and iron-ore gravel.

Davidson wrote letters to all the contractors in his vicinity, inviting them to bid on the work. He stirred up a lot of competition and, by including alternates in many cases, got some good prices. Many of the single-penetration asphalt roads were built for less than $10,000 a mile.

Several bridges were improved. One bridge approach and part of a road was built on a dredged hydraulic fill put up by the dredge Natchez. Job after job went in. By the end of the first year, improvement was visible. At the end of the second year practically 75 per cent of the original schedule was complete.

About that time it seemed advisable to enlarge the program to include other county roads which the people had expressed their desire for. A supplemental $2,400,000 bond issue was proposed. The people turned it down.

Let's Visit a Project

About ten county projects were under way when the Western Editor of this magazine visited Jefferson County. About 15 miles southwest of Beaumont, Farnsworth & Chambers Construction Co. was busy building 4.4 miles of typical all-weather county road on Project No. 84. This particular section called for grading, drainage, a 30-foot crown, and 18 feet of processed clam-shell base 6 inches thick.

The job was well organized. In less than 3,000 feet a telephone company truck was moving its poles, a motor grader was doing final blading work, and every stage of the operation was represented in between. Project Superintendent Jim Park and Foreman Pat Towery were keeping the job confined this way to complete it as they went along, and cause the local residents a minimum of delay.

Alignment was along the existing road, but the grade had to be shaped to bring the earth slightly above the natural ground, and drainage characteristics had to be improved. The grading yardage was all balanced within the roadway, however, so the two Caterpillar DW10's on this particular part of the work took a section about 1,000 feet long and worked the dirt according to cut and fill stakes set by county engineers.

As they dug and hauled the dirt, a Case rubber-tired tractor with a single set of Tampo sheepsfoot rollers compacted the lifts. The dirt was a combination of clay and sand, with a little silty loam. Comparatively deep drainage ditches were shaped along both sides of the road by a No. 12 motor grader.

The select base consisted of clam shells and a sandy loam, mixed with moisture and rolled down tight to give a high factor of cohesion. Shell was hauled by truck from a commercial supplier of the product in Beaumont. The sandy-loam binder was selected from the roadway excavation and hauled by one of the DW10's. These two materials were dumped according to volumetric calculations.

The subbase windrow was then mixed by a No. 12 Caterpillar blade, and at least one pass was also made by a Seaman Pulvi-Mixer to help with the blending. In a few cases this machine made more than one pass. The shell and sandy loam was mixed and watered.

(Concluded on next page)

HEAVY-DUTY 250 Trenchliner is a 15-ton excavator that digs up to 12½' deep, 16 to 42" wide . . . excavates 1½ to 3½ cu. yds. per minute, depending on depth, width and materials. Leaves trench clean, ready for pipe.

POWER TO DIG DOUBLE TRENCHES is built into the 310 Trenchliner. It will handle two bucket lines, dig a 6' wide box sewer at one pass. With short and long boom, it can dig step trench in single operation.

CUT WITHIN 10" of fences, trees, buildings with Parsons 221 Ladder Trenchliner. Off-set boom is shiftable across the full width, lets Trenchliner side-step obstructions. Reversible conveyor discharges spoil on either side. Model 221 digs to 8½' deep . . . 16 to 36" wide.

PARSONS TR

8 REASONS WHY YOU GET MORE FEET OF TRENCH PER HOUR . . . AT LOWER COST PER FOOT:

1. **Off-Set Boom Shifts from Side to Side** . . . digs as efficiently behind either crawler as it does in center position. Shifts easily, smoothly, because boom rides on rollers.
2. **Ladder Boom Telescopes** . . . quickly changed for depth variations. Locks securely at any point of adjustment.
3. **Conveyor Deposits on Either Side** . . . shifts by power in less than a minute. Arc makes it easy to reach up into trucks. Center-guided conveyor belt (standard on Models 221 and 250) prevents end wear on belt, assures proper alignment.
4. **Power Flow Simple, Direct** . . . gets maximum power to the digging end. Easy to control, simple to maintain.
5. **All Gears Completely Enclosed** . . . machine-cut gears, sturdy shafts, in one closed case, in continuous oil bath.
6. **Tractor-Type Crawler** . . . high rail-type crawler pad, keeps drive sprockets, chains, and lower rollers out of mud. Easily, simply adjusted. Low ground pressure. Less than 7 lbs. per sq. in. on 221 and 250, approx. 9 lbs. on Model 310.
7. **Arched Frame** . . . improves digging, travel balance, distributes weight on solid ground, well ahead of buckets.
8. **Friction Clutch Control** for boom-hoist drive on 221 and 250 provides positive, finger-tip control of boom digging depth adjustments. Independent of other operations.

CP706-REV

KOEHRING PRODUCT

PARSONS COMPANY
NEWTON, IOWA • Koehring Subsidiary

It was then laid by the blade, rolled heavily by both sheepsfoot and pneumatic rollers, and dressed to a final shape.

This particular job didn't call for an asphalt surface, since the budget didn't allow it. Ordinarily on a road of this type the shell base is primed with about 0.2 gallon of MC-1. Then a 0.25 to 0.3 shot of hot OA-230 goes on, and a spreader box applies a coat of crushed limestone or crushed gravel chips, which are rolled into the fresh asphalt. This single-penetration treatment makes a satisfactory rural road for light traffic, providing the base is thick enough and well drained.

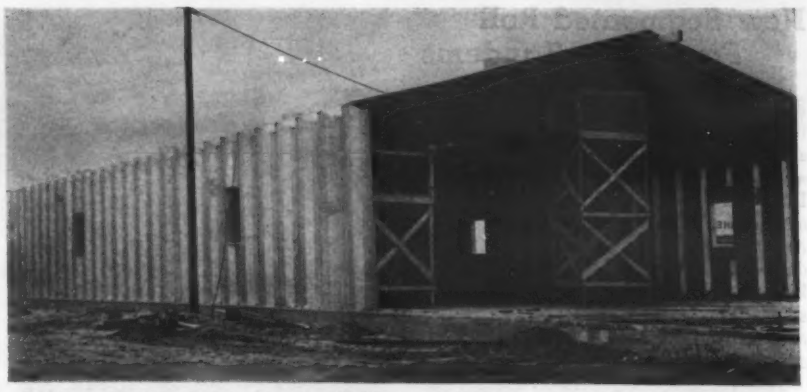
Job Almost Done

Today the 230-mile job is almost finished. It has been an adventure and a revelation to many. Davidson knows all too well that the new roads will draw heavier traffic, and that future money must be spent if today's investment is to be protected. He realizes that the best investment the county could make would be to start the studies now for that future program that will surely be needed.

Frameless Building Of Corrugated Steel

Imagine a building 50 feet wide and 200 feet long, with straight sides built without upright support members in the walls or in the interior and without truss support of any kind for the gable-type roof. This is the new frameless steel building recently developed by Behlen Mfg. Co., of Columbus, Nebr.

Walls and roof are made of 16-gage sheet-steel panels employing deep corrugations for rigidity and strength. The strips of material extend, by means of bolted connections, continuously from the floor of one side up and over the eave, over the ridge of the roof, down over the opposite eave, to the floor on the other side. Carried in a continuous strip, each panel becomes a complete support arch or truss member for the building. The panels, anchored in a concrete footing, employ the principle of self-support.



Behlen's frameless corrugated-steel buildings are built of panels which extend continuously, by bolted connections, from the floor of one side up and over and down, to the floor on the other side. Joints are sealed with synthetic rubber to make them watertight.

Corrugations reduce the width of the steel panels from 48 to 41 inches, with 2 inches used for the overlap of the joints which may be bolted, welded, or riveted. Thus, the company points out, "we lose 5 inches of panel, but gain a full structural frame".

All joints are sealed with synthetic rubber to make them watertight. Other features of the building include unobstructed floor areas, all-weather construction, and savings in materials and cost. The buildings can be built to almost any size, but certain sizes will be standardized by the company. They may be used for a variety of purposes and are constructed to withstand a combined snow and wind load of 30 pounds a square foot. Future plans include aluminum-alloy construction because of its corrosion-resistance and heat-reflecting characteristics.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 28.

A Carbide Drill Bit For Masonry Drilling

A new carbide drill for use in the Cleco Handi-Drill is now being produced by the Cleco Division of the Reed Roller Bit Co., P. O. Box 2119, Houston, Texas. Capacities are ½ to 1 inch with lengths of 6, 12, and 18 inches available. According to the manufacturer, the new drills when used with the Cleco Handi-Drill will penetrate concrete at the rate of 5 inches per minute and have been known to drill 500 holes without resharpening.

The Cleco Handi-Drill is a 9-pound hand-held drill adaptable to working in close quarters on all types of masonry. It operates at a speed of from 1,800 to 2,000 spm, has a ¼ to ¾-inch drill capacity, and is 13 inches long without retainer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 84.

Snow-Plow Attachments

A specification sheet describing the Model 61-BH Wisconsin Special V-type snow plow and the Model 63-AH Wisconsin Special reversible trip-blade snow plow, both for the Model HM Hough Payloader, has been prepared by Otto Biefeld Co., Inc., Watertown, Wis.

The V-type plow has a cutting width of 8 feet 8 inches, a front height of 4 feet, and a rear height of 6 feet. It has adjustable lever-type shoes with renewable runners. The cutting blades are ½ inch thick x 8 inches wide. The trip-blade plow has a cutting width—set at the plowing angle—of 8 feet. The height is 3 feet. It has two adjustable 8-inch-diameter shoes of the mushroom type. The cutting blade is ½ inch thick, 6 inches wide, and 10 feet long.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 22.

Eutectic Promotes Roehll

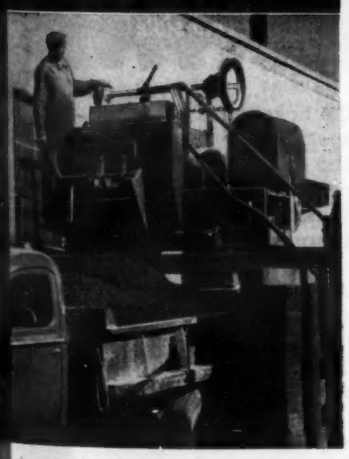
F. F. Roehll has been made National Sales Manager of Eutectic Welding Alloys Corp., New York City. He was formerly Sales Supervisor of the company's New York office.

TRENCHLINERS*

*Reg. Trademark

FOR YOUR HEAVIEST TRENCH EXCAVATION on sewer, gas and water main projects, you can keep profits up and costs down with this big Parsons 310 Trenchliner. It's built heavy-duty in every detail . . . digs up to 15' deep, 54" wide, has 45 digging speeds from 8" to186" per minute. With special dual boom, Model 310 can dig up to 6' wide.

KWIK-MIX
Bituminous
MIXERS



More Batches Per Hour, Even Quality Mix

Kwik-Mix bituminous mixers are easily adaptable from portable, rubber-tired machines to stationary plant operation. One man handles complete operation of either 10 or 14 cu ft. models. Other advantages include easy loading, non-tilting drum, fast and thorough mix, accurate control. Tower Loader is optional equipment.

KWIK-MIX
COMPANY
Port Washington, Wisconsin

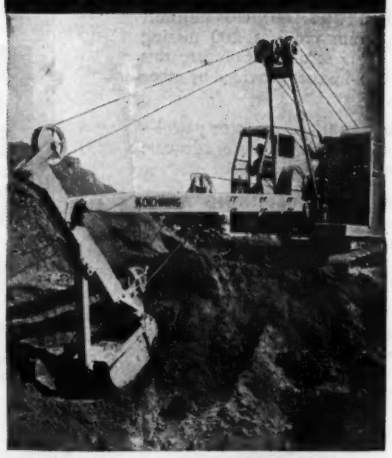
JOHNSON
Single Silo
FOR BIG STORAGE

All-Welded, Portable Cement Handling Plant

Provides capacity for 254, 373 or 492 bbls. Screw conveyor and bucket elevator, box car or truck receiving hoppers, electric bin signals, aeration diffusers. Takes one or two 1000 lb. batchers. Write for more facts.

C. S. JOHNSON
COMPANY
CHAMPAIGN, ILLINOIS

KOEHRING
for
PULL SHOVELS



Wide Trenches Need No Shoring

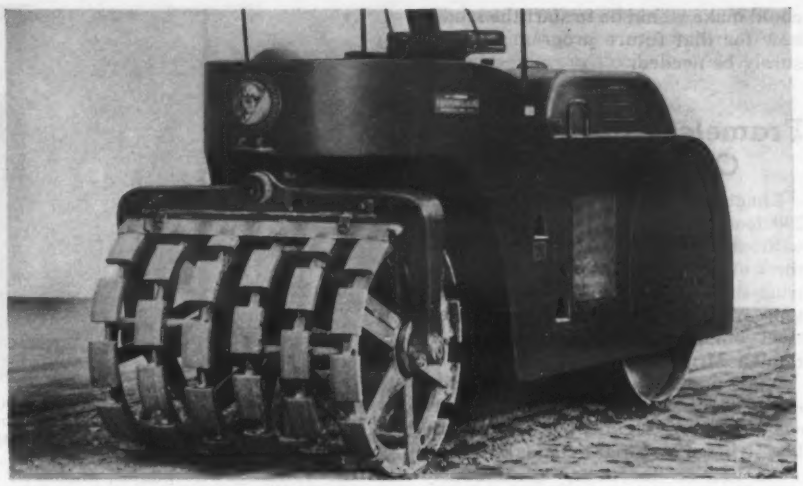
When soil conditions call for wide trenches, when rocks and boulders make use of trencher impractical, check on Koehring Pull Shovels. Available in ½ yard, ¾ yard and 1½ yard sizes. Fully convertible to shovel, crane or dragline when trenching job is done. Heavy-Duty.

KOEHRING
COMPANY
MILWAUKEE 10, WISCONSIN

New Segmented Roll For 15-Ton Tandems

New or old Buffalo-Springfield tandem rollers in the 8 to 15-ton class can now be equipped with a new type of segmented guide roll, according to an announcement by Buffalo-Springfield Roller Co., Springfield, Ohio. The roll consists of two sections mounted on roller bearings and free to rotate independently on the guide-roll axle. Heavy steel pads, mounted on sturdy spokes, are placed in staggered rows around the axle, forming the actual compacting surfaces of the roll.

The company says that recent tests on loose materials in fills and on certain stabilized-base courses have shown compaction results superior to those obtained with a sheepsfoot-type roller compacting lower elevations and a smooth-faced roller compacting top layers. The pads of the roll are designed to enter loose material with a minimum of displacement to eliminate undesirable forward flow of the materials.



Designed to enter loose material with a minimum of displacement, this pad-type or segmented guide roll can be installed on new or old Buffalo-Springfield tandem rollers in the 8 to 15-ton class.

Compaction takes place only at the lower elevations of the loose material, the company says, and the pads leave the material layer without disturbing the compacted material. With the help of the smooth rear roll too, the roller is said to compact the material layer uniformly through the entire depth. Subsequent treatment and rolling of uncompacted top layers of material is not necessary, Buffalo-Springfield points out.

Detailed specifications and information concerning both the old and new Buffalo-Springfield models on which the roll can be installed may be obtained by writing the company. Or use the Request Card at page 16. Circle No. 8.

Pennsylvania Totals Road Costs for 3 Fiscal Years

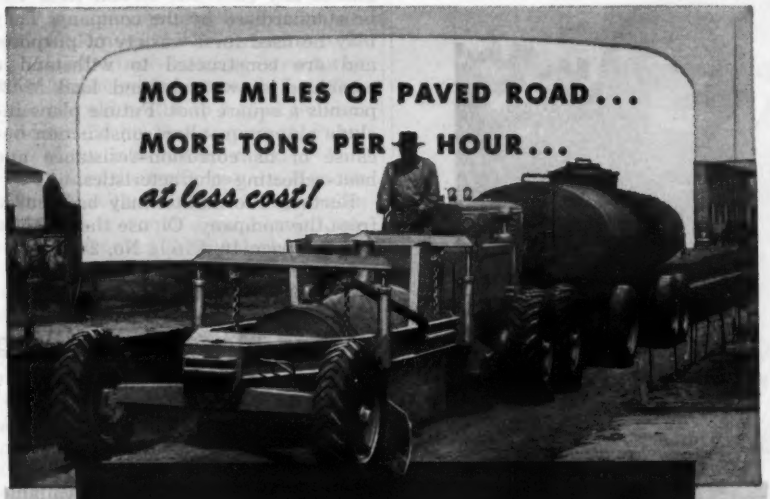
In the last three fiscal years, the Pennsylvania Department of Highways has spent $442,486,000 for road construction and maintenance. Of this, $285,550,000, an all-time high for the state, went into construction, reconstruction, resurfacing, and widening. Maintenance, including snow removal, ice control, surface treatment, and general repair, took $79,000,000, or an average of slightly more than $26,000,000 a year. The Department notes that this is the fourth consecutive fiscal year in which it has maintained its state highway system at approximately the same figure per year. It credits good management and improved equipment for this feat.

The rest of the total figure went into local streets and roads ($29,000,000); administration, engineering, overhead, etc. ($35,500,000); and special work, land purchase, buildings, and equipment ($13,400,000).

New Eye-Appeal Posters Encourage Eye Protection

Circulars describing the new Saf-I-Shield all-purpose safety goggles manufactured by United States Safety Service Co., 1215 McGee St., Kansas City 6, Mo., are now graced with a lovely Petty-type girl. The idea behind the company's campaign of circulars with poster-type backs illustrating girl lovelies is that their eye attraction will encourage eye protection. The USSCO girl will brighten many a shop and garage and at the same time remind all workers of the importance of wearing eye protection. The front of the catalog sheet gives full specifications of the Saf-I-Shield goggles.

These circulars may be obtained from the company, or by using the Request Card at page 16. Circle No. 23.



WOOD ROADMIXER

The Wood Roadmixer is your best answer to modern low cost mix-in-place construction. Here's why:

LESS MANPOWER—this *one man operated* traveling mixing plant takes low cost native materials and thoroughly mixes with emulsion, road oil or soil cement binders in one pass—windrowed and ready for spreading and compaction.

HIGH PRODUCTION, LOW COST—up to 350 tons mixed per hour at less than 7 cents a ton is not uncommon.

FULL JOB CONTROL—from start to finish. You control the rate of travel, the pressure of binder, the uniform pickup of material. With measured windrow and supervision of aggregate you're assured a surface of uniform quality every time!

SELF PROPELLED—to and from the job speeds of 15 MPH and working speeds up to 40 ft. per minute!

MORE THOROUGH MIXING—pug mill mixing drum provides 200 mixing passes in 45 seconds! Compare this to the 1 to 4 passes provided by other mixers.

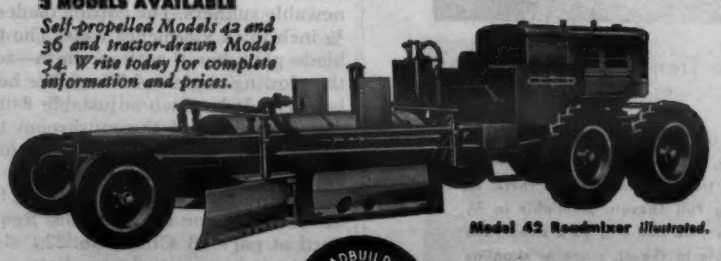
MANEUVERABLE as a motor patrol—uses pneumatic tires. Assures adequate traction in low bearing soils.

PLENTY OF ROADBUILDING APPLICATIONS—surfaces secondary roads, airfields, road shoulders, parking areas and detours. Subsurfaces major roads and airfields.

ACCEPTED AND RECOMMENDED by a majority of state highway departments, by the Civil Aeronautics Authority, U. S. Bureau of Public Roads, and the U. S. Army and Navy.

3 MODELS AVAILABLE

Self-propelled Models 42 and 36 and tractor-drawn Model 54. Write today for complete information and prices.



Model 42 Roadmixer *illustrated.*

ROADBUILDING EQUIPMENT

WOOD MANUFACTURING CO.

BOX 620 · 6900 TUJUNGA AVENUE · NORTH HOLLYWOOD, CALIF.

CONTRACTORS FAVORITE

EMBURY

LITTLE AIR PILOT LANTERN

- ★ Sturdy Compact Design
- ★ Automatic Standing Bail
- ★ Windproofed Flame
- ★ Easy to Light
- ★ Burns 30 Hours on one Filling

ORDER FROM YOUR DISTRIBUTOR
For more AIR PILOT facts, write
EMBURY MANUFACTURING CO.

240 Allen St., Warsaw, N. Y.

A 10' X 12' LOW COST STEEL BUILDING OF 1,000 USES

Portable or Permanent

USF HANDY-HUT

No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 26' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

WRITE FOR DATA

USF United Steel Fabricators, Inc. Wooster Ohio

RR Bridge Rebuilt; Commuting As Usual

Cooperation the Order of The Day as Double-Deck 13-Track Bridge Widened With No Letup in Trains

By ALFRED C. MAEVIS, Project Manager, The Arthur A. Johnson Corp. and Mason & Hanger Co., Inc., New York City

+UNINTERRUPTED service was maintained for 1,635 train movements every 24 hours while construction crews lengthened and rebuilt the 13-track double-deck Long Island Railroad Bridge over the new Van Wyck Expressway at Jamaica, N. Y. The job was performed by The Arthur A. Johnson Corp. and Mason & Hanger Co., Inc., of New York City, as joint venturers.

Rush-hour commuter train service to and from New York City is timed for train movements averaging one every 45 seconds during the morning and early evening hours, and not infrequently four or more trains are on the bridge at once. Between the job site and Jamaica Station to the east, there exists a maze of 11 crossovers and 28 switches. Any delay to a train crossing this area can reflect itself in the movement of later trains for the next hour, and be a serious inconvenience to the thousands of commuters using the railroad. Full cooperation and coordination between the operating division of the Railroad and the contractor was therefore the order of the day during and prior to construction.

What the Job Involved

The Van Wyck Expressway, which this bridge crosses, will provide ready access to New York City's new International Airport at Idlewild. When completed, it will have six express lanes together with four lanes in the service roadways. As a result, the railroad bridge, which originally measured 100 feet between abutments, now measures 194 feet 3 inches.

Briefly, the job involved widening Van Wyck Boulevard and lowering its grade. This necessitated constructing a new abutment and wing walls for the bridge, erecting two additional cross bents, and lowering the footings of another bent which was rebuilt because of an increase in the span of the girders. The diagram on the next page gives a representative elevation of the bridge showing the old and the new abutments with the positions of the new bents indicated.

The procedure on which the design was based was to complete all the substructure before beginning erection of the permanent steel and any other item of construction which would affect train schedules and routing. As preliminary moves to later track work, two signal bridges were moved to temporary locations for the duration of the job. Power cables which were supported by the bridge were removed and carried below the construction site in a temporary duct bank. Communication cables were removed from their hangers on the bridge and strung on poles clear of the working area.

Temporary Track Removal

As the first step in construction, each track and the ties were temporarily removed from service within the limits of the work, 2 feet of roadbed was removed, and foot blocks and stringers were placed as indicated on the diagram. The rail and ties were then replaced and the track restored to service. This work was usually performed on a Sunday when train movements were at a minimum and there would be no interference with traffic.

Following this, the foot blocks were replaced by cribs carried deep enough to permit the setting of the permanent deck girders at a later date. The general grade of the earth under the tracks was lowered to the base of these cribs. Most of the excavation was done by hand and buggied to a point where a crane could load it to trucks.

First step in lengthening and rebuilding the Long Island Railroad Bridge was to dig trenches for a new abutment and for a new line of columns under the lower-level tracks, with the tracks on temporary stringers and cribs.

Abutment and Column Trenches

Soldier beams were then driven along the trench lines of the new east abutment and of the footing for the line of

(*Continued on pages 64 and 65*)

SAO PAULO OR ST. PAUL
(BRAZIL) (MINNESOTA)

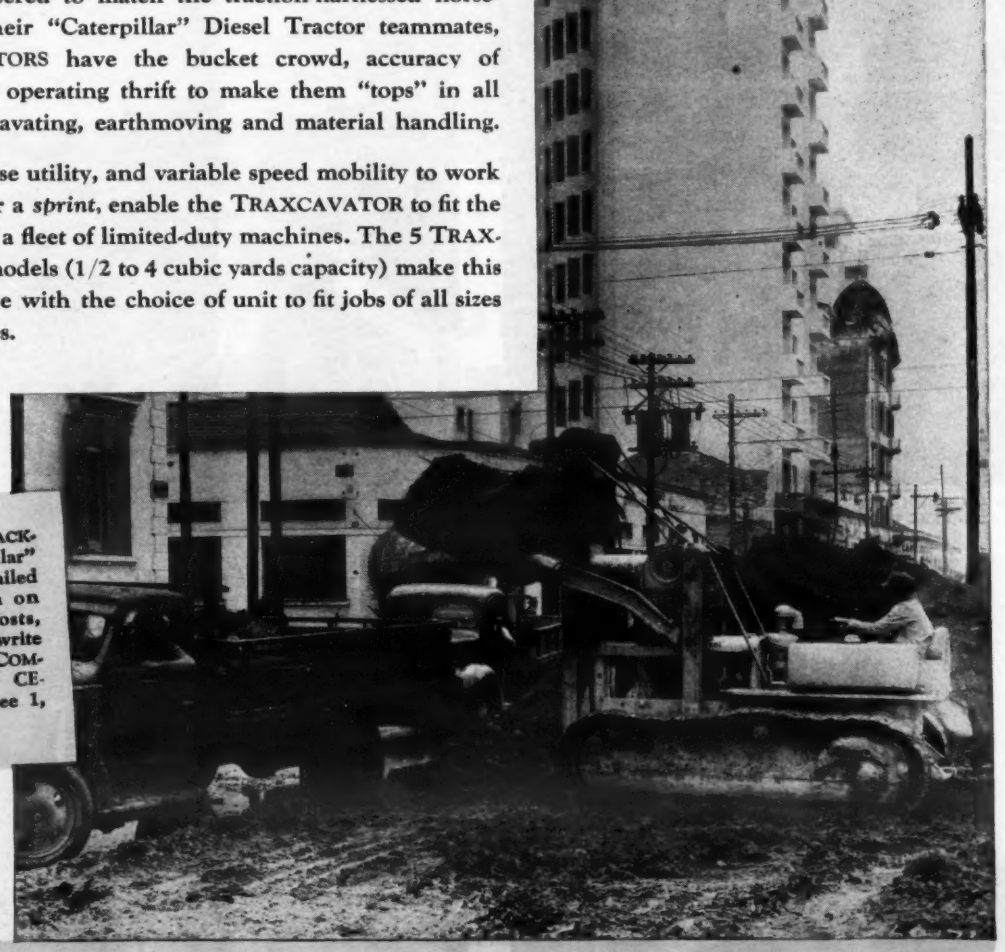
TRAXCAVATOR
Belongs **IN THE PROGRESS PICTURE!**

As key equipment on a street-widening project in the heart of Sao Paulo, Brazil, this Model T4 TRAXCAVATOR speeds digging and loading of spoil earth into trucks — a scene that is repeated on thousands of jobs the world over, from Sao Paulo to St. Paul.

The nimble TRAXCAVATOR heaps its bucket, pivots, lifts and carries, and dumps its load within half-a-minute elapsed time. Such fast performance indicates how TRAXCAVATORS multiply manpower and horsepower efficiency.

Unit engineered to match the traction-harnessed horsepower of their "Caterpillar" Diesel Tractor teammates, TRAXCAVATORS have the bucket crowd, accuracy of control and operating thrift to make them "tops" in all types of excavating, earthmoving and material handling.

Multi-purpose utility, and variable speed mobility to work at a *creep* or a *sprint*, enable the TRAXCAVATOR to fit the functions of a fleet of limited-duty machines. The 5 TRAXCAVATOR models (1/2 to 4 cubic yards capacity) make this the only line with the choice of unit to fit jobs of all sizes and purposes.



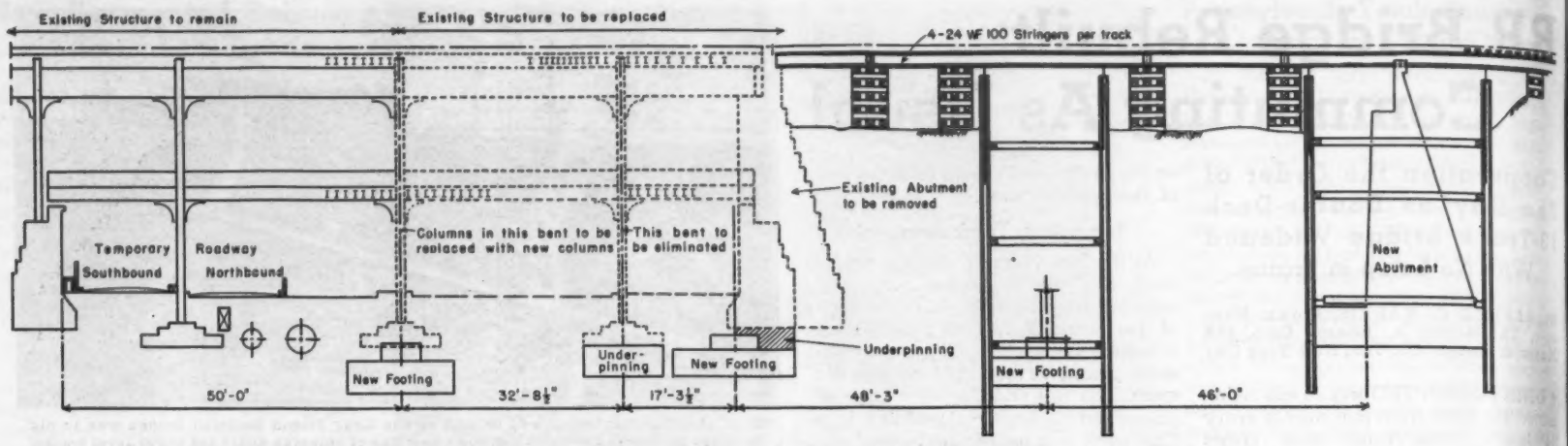
See your TRACKSON-"Caterpillar" Dealer for detailed information on capacities, costs, and prices or write TRACKSON COMPANY, Dept. CE-90, Milwaukee 1, Wisconsin.

TRAXCAVATOR® ***The Original Tractor Excavator***

AMERICAN
Deluxe Concrete
WHEELBARROW

Code
PERFECT
15 Gauge
seamless tray

The American Steel Scraper Co.
SIDNEY OHIO



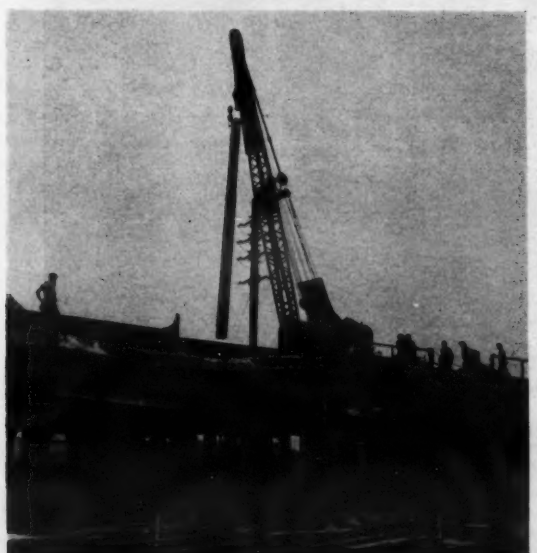
TYPICAL SECTION - LONG ISLAND RAILROAD BRIDGE OVER VAN WYCK EXPRESSWAY

With the track on temporary stringers and cribs, an overhead loader excavates in the trench for the new abutment.

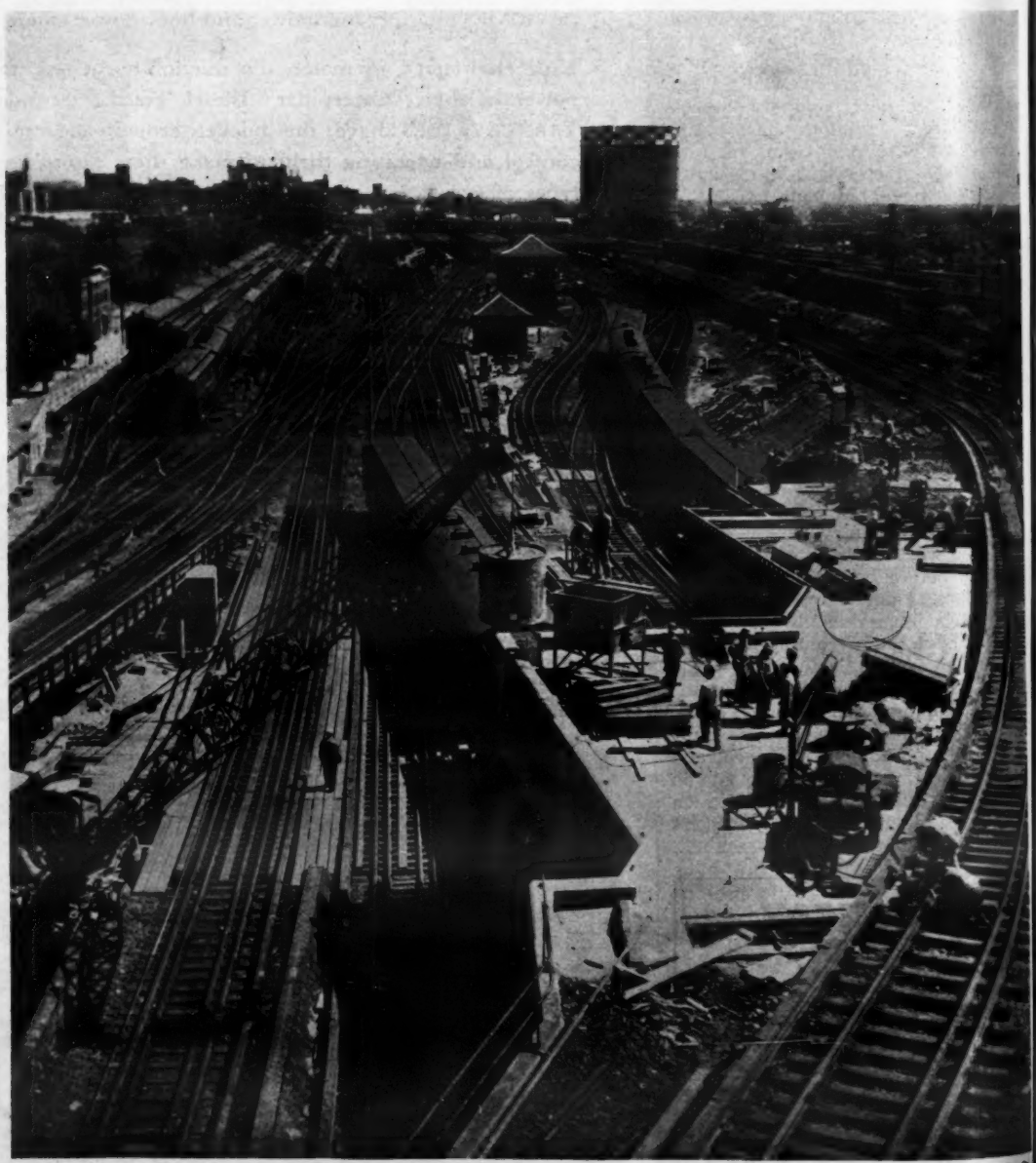
The excavation for the new abutment with a section of wall complete. Note soldier beams, horizontal sheeting.

Where expressway grade was to be lowered, two lines of columns were underpinned by the needle-beam method.

The old upper-level deck was supported on a temporary cap and posting during the steel reconstruction.



A full-length 40-foot column is set through a hole in both decks. Almost all steel shown is to be replaced.



You can see what it meant to maintain uninterrupted train service during the job. Jamaica Station is in the background; 11 crossovers and 28 switches are in between. A final concrete pour on the upper bridge deck.

A locomotive crane removes a section of old upper-deck slab, with one track out of service. On the left and in the foreground, new steel is completed.

High-early-strength concrete is poured on the first section of upper-deck slab to permit it to carry loads in 3 days. To the left are parapet wall forms.

RR Bridge Rebuilt; Commuting As Usual

(Continued from page 63)

columns behind the old abutment. Where possible, a Caterpillar-mounted crane was used to drive these soldiers to their proper depth; in other locations, a locomotive crane drove the soldiers when train movements on the adjoining tracks permitted. Where neither method could be used, sheeted pits were dug the full depth of the soldier, and the soldier beams were set in place and concrete footings poured around their lower ends.

To reduce the span of the temporary stringers supporting the track, caps were set on top of the soldiers which then acted as bearing piles to carry train loads. With the soldiers in place, the trenches for the wall and for the column footing were drifted under the track. Horizontal 3 and 4-inch sheeting inserted behind the soldier flanges was used as the work progressed. Where required, wales and struts were installed as the excavation depth increased.

When the width of the trench permitted, an overhead loader mounted on a tractor-dozer brought the material out from under the tracks to where it could be handled by a crane. Where the trench was too narrow, the material was brought forward in rubber-tired buggies operated by manpower.

Footings and Columns

When excavation of the trenches was completed, the new footings were poured and the abutment wall was carried up to the under side of the temporary track stringers. Perforated-pipe drains were placed and bagged gravel was stacked for the height of the wall as the space behind the new abutment was backfilled.

In the area of the old roadway where the expressway grade was to be lowered, two lines of columns were underpinned using the needle-beam method. Brackets were riveted to the columns and the column load was transferred through the brackets to steel needle

(Concluded on next page)

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DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

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More truckers use Chevrolets than any other make. And one important reason is Valve-in-Head engine design. For 38 years Chevrolet has been the largest producer of valve-in-head engines — engines world famous for power, dependability and outstanding economy.

Lower Cost per Mile! Chevrolet's Valve-in-Head Loadmaster engine and Chevrolet's greater horsepower at the clutch add up to important advantages to truckers. They mean greater efficiency—they mean *bigger payloads at lower cost per mile!*

Better Buy . . . Better Resale! Low first cost coupled with dependability and economy make Chevrolet trucks *the buy*. Chevrolet trucks have led in demand and sales for the last eight consecutive truck production years . . . are far ahead this year, according to current registration figures. Here is proof of greater owner satisfaction . . . satisfaction which has made Chevrolet's higher resale value traditional across the nation.

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CUT YOUR COSTS ON EVERY HAUL!

Chevrolet heavy-duty trucks with Loadmaster engine actually deliver *more horsepower at the clutch* . . . more *net* horsepower—proved by certified ratings on engines used as standard equipment in conventional models of the five most popular makes, 13,000 to 16,000 lbs. G.V.W.* Here, then, is power to *move* big payloads . . . in a truck with strength to *carry* big payloads . . . and these add up to outstanding, all-around efficiency. You save on gas, oil and upkeep, cutting your costs on every haul! See your Chevrolet dealer—get the full story of Chevrolet leadership. **Gross Vehicle Weight*

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TWO GREAT VALVE-IN-HEAD ENGINES: the new Loadmaster and the improved Thriftmaster—to give you greater power per gallon, lower cost per load • THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—5 times more durable than spiral bevel type • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • ADVANCE-DESIGN STYLING with the "Cab that Breathes" • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—precision built.

RR Bridge Rebuilt; Commuting As Usual

(*Continued from preceding page*)

beams supported on cribs clear of the new footings. To insure full load transference to the needle beams, hydraulic jacks were used to raise the column until a hair-line space could be seen under the base plate of the column.

The old footing was removed and the new footing poured. When the concrete had set, the columns were placed on short temporary piers atop the new footings and the loads transferred by the hydraulic jacks. A total of 30 columns with loads varying between 295 and 1,186 kips were underpinned, depths varying between 3 feet and 20 feet.

Where the new footings were below the existing abutment, the footing was built in 8-foot alternate sections, and the wall underpinned to the top of each section before the remaining sections were built.

All of the foregoing work was done in advance of any work on the reconstruction of the existing steel structure. It was decided that by doing as much work as possible in advance, the interference with train operation would be considerably less than if some items were left until the steel erection had been started.

Steel, Decks, Tracks

Steel erection was begun on the upper level with the columns at the old center line of roadway being replaced with new ones. Temporary shoring, made up of 12 x 12-inch or 14 x 14-inch wood posts in groups of four, supported the existing girders while the old steel was cut out and the new set. By eliminating cross bearing of timber and employing steel wedges, unit stresses of more than 1,000 psi were used in the timber.

Then, starting with the southerly track, train traffic was rerouted to adjoining tracks while the track was removed together with its two lines of supporting girders and the deck slab. The deck for the adjoining track was temporarily supported on a 14-inch steel cap atop 8 x 12-inch posts. Because of the lower-level tracks, this was the maximum size of posting that could be used and still leave a safe but close clearance for trains. Close-clearance orders were issued to all trains which were operating through the bridge.

The new steel was erected and riveted, and high-early-strength concrete was poured for the deck slab to permit it to carry loads within 3 days of pouring. Fabric waterproofing was laid and protected by asphalt plank, then the track was replaced, signals and third rail were restored, and the track was put back into operation.

Subsequent tracks were completed in the same way, except that it was necessary to remove but one line of girders for each of those which followed. Lower-level steel erection followed the same general procedure. There was a saving in time, however, because full-length columns which supported both upper and lower-level girders had been set as part of the upper-deck steel. It was also possible to set a considerable number of lower-level girders in advance of taking a track out of service.

With steel in place for the lower-level track, workmen remove the old east abutment in 1½-cubic-yard pieces by drilling and plug and feathers. No blasting was permitted.

The time allowed for each track move was 30 days, and while it was exceeded in some cases, the average actual time used was three weeks per track.

Vehicular traffic was maintained on Van Wyck Boulevard throughout by crowding two traffic lanes into what was originally a sidewalk area and part of the main roadway. This area was clear of the working area.

Personnel

The contract for the work amounted to $2,590,000 and was under the supervision of the New York State Department of Public Works and the Long Island Railroad. For the joint-venture contractors, the work was under the direction of Charles B. Molineaux, General Manager, and Alfred C. Maevis, Project Manager. For the Railroad, T. W. Pinard is Chief Engineer and George Patton is Engineer in Charge. J. J. Darcy is District Engineer and P. O. Hale is Resident Engineer for the New York State Department of Public Works.

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It will pay *you* to investigate Flexcell Bituminous Fibre Expansion Joint Filler for pavements, sidewalks, curbs, gutters, driveways, etc., on projects of all types. Write today for specifications and prices. The Celotex Corporation, Chicago 3, Illinois.

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3 COMPRESSIBLE. Compresses uniformly. No hard cross-grain, knots, or other defects. Provides 50% compression under loads up to 750 lbs. per square inch.

4 DURABLE. Proved by years of actual use in major installations all over the nation. Withstands severest service, extremes of heat and cold. Protected against termite and fungus attack by the exclusive patented Ferox® Process.

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8 EASY WORKABILITY. Lightweight, easily cut with hand saw, readily stored, holds its shape indefinitely. Provides neat, finished joint with no trimming.

9 ALWAYS UNIFORM. Precise scientific control during manufacture assures uniformly high quality and dependability.

10 VERSATILE. Outstanding for work requiring special cutting, tapering, and fabricating. Unsurpassed for concrete work above grade, around bridges, grade separations, overpasses, and concrete building construction. Replaces products of much greater cost.

11 ECONOMICAL. Measured in terms of performance and service, Flexcell is indisputably the most economical product of its type on the market.

12 QUICKLY AVAILABLE. Distributors of Flexcell joint filler conveniently located from coast to coast are kept supplied with ample stocks at all times. These distributors are equipped to handle all requirements, special sizes, cutting, punching—promptly, without delay!

SPECIFICATION APPROVALS

Flexcell® Bituminous Fibre Expansion Joint Filler meets the requirements of: American Association of State Highway Officials Standard Specification M 59-49. Federal Specification HH-F-334. American Society for Testing Materials Tentative Revisions of Standard Specifications for Preformed Expansion Joint Filler D 544-48.

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BITUMINOUS FIBRE EXPANSION JOINT FILLER
The Celotex Corporation, Chicago 3, Illinois

The Hennessy tire-bead breaker has a telescoping piston-like handle which drives a special breaker between rim and tire.

Tire-Bead Breaker

An improved truck and tractor tire-bead loosener has been announced by Jack P. Hennessy Sales Co., P. O. Box 22, Audubon Station, New York 32, N. Y. This tool, the company says, is designed to loosen the toughest truck or tractor tire bead. The self-oiling breaker is built with a telescoping piston-like handle which drives a special bead breaker between the rim and the tire. It will free the tire quickly and will not damage it or the rim, says Hennessy.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 135.

Hydraulic Power Unit

An electrically driven hydraulic power unit for operating a single-acting hydraulic cylinder has been developed by the Coates Mfg. Co., Corydon, Iowa. Especially suited for a truck-mounted snowplow or similar equipment, it is a compact unit comprising tank, pump, motor, and magnetic control valve, and is said to be simple to install and operate.

The Elec-Draulic mounts under the hood of the truck, with the cable connected to the battery and the ground wires run to a cab switch. The hydraulic line is connected from the pump to the cylinder. A high-grade gear-type pump provides pressures up to 1,000 psi. Power is provided by a 6-volt Ford starting motor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 58.

Bulletin on Quarry Plants

An 8-page bulletin on portable and stationary quarry plants is offered by Diamond Iron Works, Inc., Minneapolis 11, Minn. A quarry setup must be designed with four fundamental facts in mind, the folder explains: types of stone or gravel present, types of finished material to be produced, average capacity required, and whether or not washing is to be a part of the operation.

The booklet goes on to point out how Diamond equipment may be used to meet individual needs. It illustrates typical or standard layouts with plan and elevation views and action photographs. It gives full specifications for five of the portable primary plants and four of the portable standard Rotor-Lift plants.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 142.

Borg-Warner Appointments

J. Nall Candler has been appointed Administrative Assistant to F. M. Hawley, President and General Manager of Morse Chain Co., a division of Borg-Warner Corp.

Robert N. Black has been made Supply Manager of Borg-Warner International Corp. He recently returned from a 6-month business tour of all South American countries.

Studies Steel-Structure Cleaning and Painting

The Steel Structures Painting Council was created in Pittsburgh, Pa., on May 9, at a meeting of representatives of seventeen interested organizations.

The council intends to review the cleaning and painting of steel structures in order to determine and outline the best methods, to issue a code covering present practical and economical methods of surface preparation and painting, to do further research on the prevention of corrosion of steel structures, and to issue recommendations on effective steel protection. It will also establish a research fellowship at the Mellon Institute of Industrial Research in Pittsburgh.

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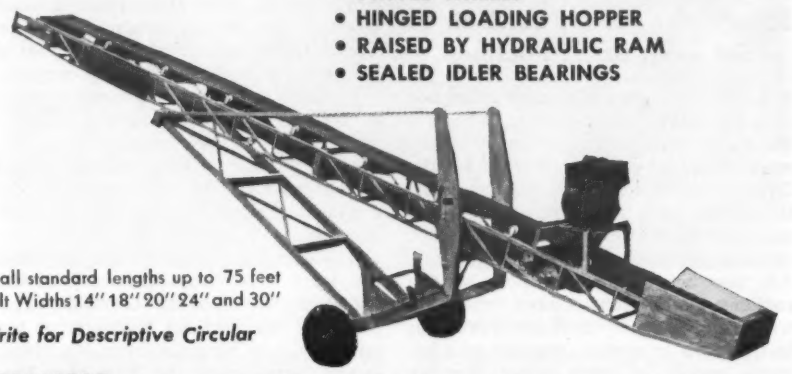

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Belt Widths 14" 18" 20" 24" and 30"

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SEAMAN TRAV-L-PLANT NETS NEW HIGH PRODUCTION

View showing train operation developed by Glen G. Searing to do 42 miles of road in 35 working days. Tractor pulls transfer truck which is followed by SEAMAN TRAV-L-PLANT.

The SEAMAN Self-Propelled TRAV-L-PLANT

SEAMAN Self-Propelled TRAV-L-PLANT is equipped with spray bar, pump, pump tachometer and tachometer wheel. Spray bar is located just ahead of mixing rotor so that bitumen is taken into mix immediately, thus avoiding migration. Pump also handles water for soil stabilization. Offered in 7ft. mixing width. Gasoline or diesel powered. Obtainable also without pumping equipment as the SEAMAN Self-Propelled Mixer.

FREE DESCRIPTIVE FOLDER

This new folder completely describes the SEAMAN TRAV-L-PLANT and SEAMAN Self-Propelled Mixer. Shows job scenes, gives complete specifications. Send for your copy now.

SEAMAN MOTORS, INC.

282 NO. 25th STREET • MILWAUKEE 3, WIS.

Glen G. Searing, Jacksonville, Fla., Contractor Finishes More Than Mile Per Day on 42 Mile Job

Jacksonville, Fla. "Good as a plant mix any time" says Glen G. Searing referring to 42 miles of bituminous highway he has just completed for Jacksonville County. Searing used the SEAMAN Self-Propelled TRAV-L-PLANT for mixing on the entire job. RC-1 was the binder employed and the mixing specified for 5 in. compacted depth.

DEVELOPS TRAIN OPERATION

Mr. Searing developed a smoothly operating train by hitching his transfer trucks to a tractor. The SEAMAN TRAV-L-PLANT followed immediately behind the transport. The tractor was used to pull the transfer truck because of the extremely sandy condition but this method was advantageous in obtaining an easy, steady uniform traveling speed for the entire train even in normal conditions due to the tractor low gear operation.

TRANSFER TRUCKS UNLOADED QUICKLY

Transfer trucks of 5000 gal. were unloaded in about 30 minutes each. If at any time a transfer was delayed the SEAMAN MIXER continued with the work of mixing and aerating. This phase of the work was done at 3 miles an hour. During train operation, mixing was handled at 50 ft. per minute because the oil requirement ranged between 3.7 to 5 gallons per square yard. The total average for all mixing ran about 75 ft. per minute in paths 7 ft. wide.

HIGH OUTPUT PER HOUR

As much as 6400 gals. of RC-1 per hour were put in and the hourly average for the job ran about 6200 gals. The 42 miles was completed in 35 working days, or 1.2 miles per day.

Virginia the Richer By 4 More Waysides

1950 Roadside-Development Program Includes Use of Machines for Fertilizing, Seeding, and Mulching

✦ FOUR new waysides with improved facilities have been added this year to the Virginia highway system under the roadside-development program of the State Department of Highways. This brings to fifty the number of such small parks, bordering on major roads, that are scattered throughout the state. All new waysides, like most of the earlier installations, have drinking water and sanitary facilities available; tested wells or springs provide an adequate supply of fresh water. Besides these waysides used primarily by travelers for parking and picnicking, the State also has 2,000 picnic tables spotted singly or in small groups at frequent intervals along the highways.

Good Locations

The State has been particularly fortunate in the excellent locations that were obtained for these new waysides, especially with reference to the beautiful natural scenery. Potoma Wayside, for instance, on U. S. 340 in Loudoun County, overlooks the Potomac River and the new bridge crossing it to Maryland. The site is close to Harpers Ferry, West Virginia, that historic intersection of three states and two rivers, the Potomac and Shenandoah. The 8 acres obtained for the wayside extend from the newly located highway down to the edge of the river. Parking turnouts, protected by heavy stone parapet walls, overlook rugged mountainous terrain. Picnic tables and fireplaces are part of the development plan for this wayside.

Another wayside with a water view is Dahlgren in King George County bordering on the lower end of the broad Potomac River, which is crossed at that point by the 2.2-mile-long Morgantown Bridge. A 3-acre tract with one side adjacent to U. S. 301 was acquired by the State for the site from the large river-front property of the U. S. Naval Proving Grounds. This point on the Federal highway, at the entrance into Virginia from Maryland, is one terminus of the Blue Star Memorial Highway in Virginia.

Dahlgren Wayside boasts of a good stand of shade trees on a slight bluff which runs down to the edge of the river where visitors may enjoy bathing. Ample space for parking cars is marked off by logs laid on the ground. The facilities available are typical of all waysides of similar size, including drinking water, toilets for men and women, six picnic tables with benches attached, a trash can for each table, and fireplaces.

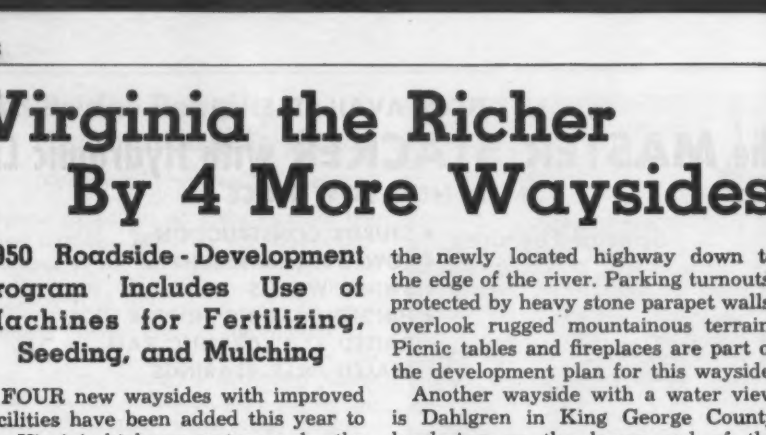
Robert E. Lee Wayside

One of the larger new sites is the Robert E. Lee Wayside, 2 miles east of Buckingham on U. S. 60 in Buckingham County, where the State acquired 19 acres of land. This location has great historical interest as it was the scene of the last encampment of the Confederate Army of Northern Virginia under Lee in the closing days of the War after the withdrawal from Richmond. Appomattox is 20 miles southwest of the wayside.

C. & E. M. Photo
Dahlgren Wayside on U. S. 301 in Virginia borders the lower end of the Potomac River. It has a good stand of shade trees and travelers can enjoy river bathing.

Another site on U. S. 60 is Toeink Wayside in New Kent County, south-

(*Continued on next page*)



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east of Richmond in the Peninsula country lying between the York and the James rivers. At this point the divided highway widens out forming a wide median of which 15 acres have been set aside for the roadside park.

Another wayside, Elizabeth River, on U. S. 13 on the east branch of the Elizabeth River, just east of Norfolk, is being improved with the installation of facilities for drinking water, toilets, shelters, etc.

New Picnic Shelter

The Highway Department is also putting up good-size picnic shelters in many of its waysides. These structures are 43 feet 5 inches long x 26 feet 2 inches wide, which includes a covered porch 16 feet 10 inches deep running the length of the shelter. Opening on the other side are toilet rooms for men and women, each 17 feet 6 inches x 9 feet 4 inches, separated by a storage room at the center of the building.

The shelters are built with concrete foundation floor slabs, with timber trusses supporting shingle roofs. Wood posts hold up the roof along the porch, which is open on three sides. The porch has a brick fireplace flanked on each side by a drinking fountain, all built into the back wall. Ample room is provided for two picnic tables on the porch.

Materials for the building portions of the shelters vary somewhat according to the location. At Goshen Pass native stone is used in the construction. Logs with mortar filler serve the purpose at Elizabeth River. At Carter Memorial Wayside in Wythe County on U. S. 11, the shelter was built with cinder block covered with brick veneer.

Attractive Approaches

In addition to these wayside improvements, the roadside-development program includes a study of all approaches on main highways entering Virginia. Cooperation is sought with the adjoining states to work out a pleasant setting at these boundary sites. Roadways on both sides of the line are cleaned up, and plantings are set out to render a pleasing appearance at such points.

Planting is done in Virginia in both spring and fall. The early months of 1950 were mild and free from snow, affording a long spring planting season that extended from February into June. Fall planting usually gets under way late in August, and may extend into December, when snow or frozen ground puts an end to the seasonal operations. This past spring about 150 miles of highway were seeded on shoulders, ditches, and slopes in an intensive campaign of erosion control. Some good results were also achieved in this regard with kudzu vine on slopes over 25 feet high. While kudzu is widely used in the Deep South as planting to check erosion on long slopes, Virginia probably is the northern limit for the growth of this hardy vine plant.

As many as sixteen different species of grass seed and legumes are planted in the state, ranging from a bluegrass in the mountainous west, to a mixture of clover, bluegrass, and Bermuda in the Piedmont and Tidewater section along the eastern coastal plain. Fescues predominate on northern exposures and in shady areas. This fall some 25 tons of grass seed will be planted.

On new highways, turfing in the median strips on dual roads is usually included in the principal contract. Thus there is no interference with traffic when the project is finally completed. State forces then handle the rest of the planting on the shoulders, ditches, and slopes after the road is opened.

Mechanical Aids

Costs of fertilizing, seeding, and mulching have been reduced as much as 60 per cent in Virginia in recent years with the use of mechanical equipment to replace hand methods. After slopes have been roughened or scarified when necessary, they may be mulched with hay, tobacco stems, or straw applied by a trailer-mounted blower operating along the shoulders. Seed and fertilizer are then put on at the same time by a truck-mounted spray rig.

The rig consists of a 1,000-gallon tank equipped with a mechanical agitator to keep the seed and fertilizer in suspension in the water until the mix is applied. For seeding one acre the ingredients are 800 pounds of 10-6-4 fertilizer and 60 to 80 pounds of grass seed in 750 gallons of water. This mix is sprayed through a nozzle at 70-pound pressure by a 3-inch centrifugal pump driven by a 35-hp gas engine. It carries a distance of 40 feet and the tank is emptied in only 20 minutes. The rig was made in the highway-department equipment depot.

It is estimated that about 80 per cent of the sprayed seed passes through the mulch and takes root in the moistened ground; and that after the first rain, the remainder of the seed, retained on the mulch, washes through and also takes hold. If any spots are missed in this first seeding, they are attended to the next season. Where the slopes are

(*Concluded on next page*)

Virginia Dept. of Highways Photo

Virginia uses hay, tobacco stems, or straw for mulch and applies it to slopes with a blower mounted on a trailer. Here the rig operates in Montgomery County.

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ALL-STEEL, ALL-PURPOSE SERVICE BODIES

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Virginia the Richer By 4 More Waysides

(*Continued from preceding page*)

barren, fertilizer without the seed may be sprayed on to enrich them in advance of planting. The Department expects to use 240 tons of 10-6-4 fertilizer this fall in planting 25 tons of grass seed.

Seeding is often followed by an asphalt spray on high slopes which helps to hold the mulch in place and keep it from blowing away. An AE-1 asphalt emulsion is used in this work, applied at the rate of 0.1 gallon to the square yard at temperatures above 70 degrees F. The bitumen is pumped out of barrels by a 2-inch pump and sprayed on the slopes. The rig is mounted on a skid which is easily shifted about the various highway districts in the state by truck.

Personnel

The roadside-development work of the Virginia Department of Highways is under the direction of Harold J. Neale, Landscape Engineer. The Department is headed by Gen. James A. Anderson, Chairman of the Commission; C. S. Mullen is Chief Engineer.

A 2-Ton Power Puller

A lightweight hand-operated power puller for moving machinery, handling heavy equipment, all types of rigging work, pulling stumps, laying pipelines, and erecting or dismantling buildings is described in a new 4-page folder prepared by The Wyeth-Scott Co., Sisal St., Newark, Ohio.

One contractor, the folder points out, used 24 of the More Power pullers to lay two pipelines across a river; use of the puller made it possible to lay the pipe without draining the river and without developing any leaks in the pipes. Another application was the raising of heavy equipment to the top of television towers with 48 of the pullers. The folder gives complete specifications for the unit, which is available in a 2-ton-capacity model with cable lengths of 20, 30, or 40 feet. Results of tests performed by Ohio State University are included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 33.

D-A Lubricant Names Fitz

Donald D. Fitz is representing the D-A Lubricant Co., Inc., Indianapolis, Ind., throughout Iowa. He handles the sale and service of D-A heavy-duty lubricants and engine oils from his headquarters at the Blue Line Storage Co., 200 Elm St., Des Moines, Iowa.

The Sterling Model A earth borer shows its stuff.

Hydraulic Controls On New Earth Borer

The new hydraulically controlled earth-boring machine made by Sterling Engineering & Mfg. Co., Wilkes-Barre, Pa., is designed to meet many digging needs. The Sterling Model A, with turntable mounting, will dig in any desired location from either side or the rear of the truck body. It will handle 12, 16, 20, 24, and 26-inch augers and operate at any angle. The swing mounting enables operation 4 feet to the left or right of the truck center. A fixed-position mounting is also available.

Power plant for the new unit is a Ford industrial 6-cylinder engine with a 226-cubic-inch displacement. Full hydraulic controls are provided. The frame is of welded I-beam construction. Extras such as a pole setter, etc. are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 139.

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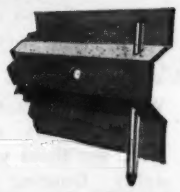

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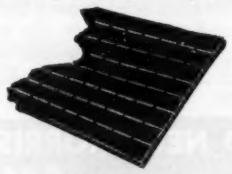
Eliminate blow-ups, prevent spalling, control cracking. Use with or without dowel bars. Rugged asphalt mastic composition outlasts metal. Millions of feet in use.



DUMMY JOINTS
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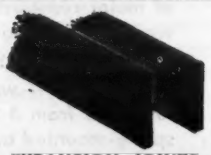
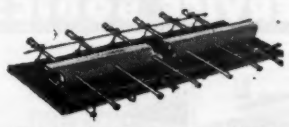


EXPANSION JOINTS
Two types. Choose non-extruding, resilient fibre joint or premoulded, waterproof asphalt joint. Meet all Federal and State specifications. Approved by CAA and U.S. Engineers.



WATERPROOF BASE PLATES
Prevents water seepage under the joints. Acts as water seal for subgrade and also helps keep wire supporting basket from sinking out of position during pouring.

CONCRETE CURING COMPOUND
Retains 95% of moisture during vital curing period. Comes with fugitive dye or white pigment. Automatic spray machines available for any size job. Write for folder.

New KAPCO
FIBREGLAS
EXPANSION JOINT
NOW AVAILABLE
Write for Complete Details

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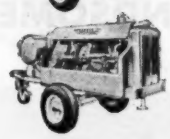
4 days' work in 3 with
JAEGER AIR

Jaeger Model 250 holds full pressure behind 2 heavy rock drills . . . averages 35% more daily footage than with any 210 ft. compressor.

Other Jaeger "new standard" ratings give you comparable increases in production as shown below.

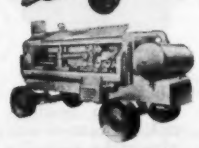
Model 75 runs a heavy breaker or sheeting driver, 2 clay spades or 3 tampers at full pressure. No 60 ft. can do this.

Model 125 runs 2 heavy breakers at full pressure. No 105 ft. can do this.



Model 185 runs 3 heavy breakers or 2 medium rock drills at full pressure. No 160 ft. can do this.

Model 365 runs a heavy duty wagon drill, plus a rock drill or heavy breaker at full pressure. No 315 ft. can do this.



Model 600 runs 2 heavy duty wagon drills at full pressure, which use 500 ft. can do, and has air to spare for auxiliary drilling.

If 30% to 40% more production with the same men and tools sounds interesting, see your Jaeger distributor—or ask us for Catalog JC-8.

See your Jaeger distributor or write

THE JAEGER MACHINE CO.
701 Dublin Avenue Columbus 16, Ohio
PUMPS • MIXERS • HOISTS • TOWERS
TRUCK MIXERS • PAVING MACHINERY

With the Comet Cub woodworking tool, routing may be done freehand, against the shaper fence, or with a template. Foot-operated, the router table can be accurately set for depth of cut with its special micrometer depth-adjuster.

A Woodworking Tool With Radial Saw Arm

A universal woodworking tool designed for a variety of shop operations has been developed by the Consolidated Machinery & Supply Co., 2029 Santa Fe Ave., Los Angeles 1, Calif. It will crosscut, rip, bevel rip, miter, compound miter, tennon, bore, carve, rout, plane, shape, dado, plough, buff sand, turn, and perform many other woodworking jobs, each with a minor resetting. Its 2-speed motor enables application of the proper speed for each job.

The Comet Cub incorporates an overhead retractable radial saw arm, mounted on lubricated ball bearings, that moves with the saw and provides an unobstructed view of the work. It is powered by a 110-volt ¾-hp duplex-drive motor, with one shaft that turns at 12,500 rpm and a second shaft that turns at 7,200 rpm.

Accessories include a boring table, adjustable router-shaper table, lathe, shaper fences, power takeoff, sanding table, miter gage, buffing, grinding wheels, adjustable dado head, and a large collection of cutting blades and heads for many woodworking purposes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 69.

Prepumped Fuel Can

A can that delivers fuel by prepumped air pressure without lifting or funneling and dispenses gasoline, fuel oil, or kerosene without spilling, has been developed by the Fillmaster Co., 1701 Dorr St., Toledo, Ohio. The Fillmaster consists of a Neoprene ½-inch hose, a safety valve to eliminate danger from excessive pressure, a pressure pump with built-in locking handles for carrying ease, and a hand-operated squeeze nozzle that dispenses 1 gpm. The unit is available in rustproof containers of 5-gallon size. It is designed for use in fueling or refueling mowers and brush-cutting implements, power saws, small pumps, lamps and lanterns, road torches, and other units.

Further information may be secured from the company. Or use the Request card at page 16. Circle No. 102.

Many Catalogs on Lathes

A number of catalogs on lathes for repair, maintenance, and fabricating operations have been prepared by The Nebel Machine Tool Co., Cincinnati 25, Ohio. Each covers a specific model, including 16, 18, 20, 22, 25, and 27-inches, both geared-head and cone-head belt-drive series. Additional catalogs present the company's line of removable-block and extension-bed gap lathes. These bulletins illustrate and describe each model, listing complete specifications, construction features, and standard and extra equipment.

Another catalog outlines the attachments and accessories available for Nebel removable-block and extension-bed gap lathes. These items include milling and keyway cutting attachments, adjustable thread stops, micrometer carriage stops, raising blocks, pipe centers, special steady rests, follow rests, and taper attachments.

One or more of these catalogs may be obtained by writing the company, indicating the size and type of lathe you are interested in. Or use the Request Card at page 16. Circle No. 97 and specify your needs.

Represents Pumpcrete in West

William N. Rogers is now Western Pumpcrete Representative for the Chain Belt Co. of Milwaukee, Wis. From headquarters in Los Angeles, Mr. Rogers will work with distributors in eleven western states and assist users and prospective users of Pumpcrete.

Multi-Purpose Dozer-Rake

A 4-in-1 combination dozer blade, rake, stump remover, and ripper—is featured in a 4-page folder issued by Northwest Tractor & Equipment Corp., 5800 E. Marginal Way, Seattle 4, Wash. The Norwestrac multi-purpose blade was developed for use with Caterpillar D7 and D8 tractors in land-clearing operations, and features 6 heavy-duty teeth that can be made an integral part of the bulldozer blade. The teeth are inserted in specially designed slots and held by a locking pin. The fact that the teeth are designed specifically for use with the blade and are easily replaced reduces maintenance costs, the catalog says.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 62.

LANSING F4-½ WHEELBARROW

The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

LANSING COMPANY
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Builders of wheelbarrows for over 68 years

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from the ground up—

there's a SCHRAMM Compressor to fit your air needs!

MODELS 20 and 35 . . . For Tire Inflation, Scaling, Impact Wrenches, Grease Guns, Paint Sprays and Road Markers.

MODEL 60 . . . For Jobs where large compressors are not required; Riveting, Tamping, Waterproofing and Insulating.

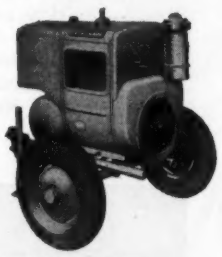
MODELS 60 and 105 . . . *Pneumatractor* Self-Propelled. For Trench Work, Loading, and all air applications.

MODEL 105 . . . Highly portable compressor for average construction jobs and auxiliary on large tools.

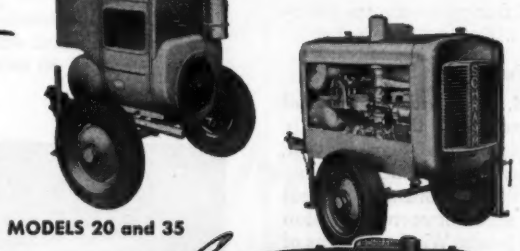
MODELS 210, 315 and 420 . . . Large Compressors for operating multiple tool combinations on big engineering projects.

TO GIVE YOU A COMPLETE PACKAGE

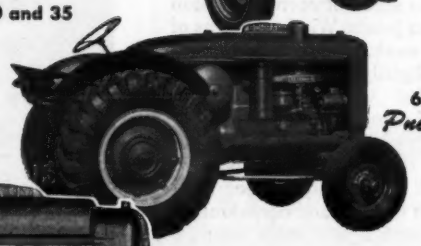
The SCHRAMM Line of Construction Tools includes: Rock Drills . . . Wagon Drills . . . Paving Breakers . . . Clay and Trench Spades . . . Backfill and Tie Tampers . . . Track Spike and Form Pin Drivers . . . Sheeting Drivers . . . Chain Saws . . . Concrete Vibrators . . . Paint Sprays . . . Tools for Breakers and Diggers . . . Air Hose and Accessories.



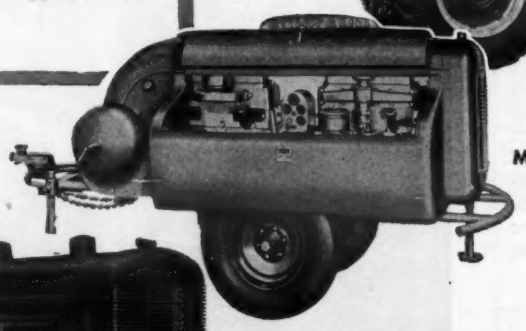
MODEL 60



MODELS 20 and 35



MODELS 60 and 105 *Pneumatractor*



MODEL 105

MODELS 210, 315 and 420

REMEMBER. There's a Schramm Air Compressor and auxiliary tools available for your many compressed air needs. For complete details, write us today.

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The Compressor People
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Hot-Mix Reclaims Pumping Concrete

Maintenance Crews Repair 21-Year-Old Slab Through Arkansas Ozarks; Battle Water Seepage Problem

+ TWO decades and more ago, when Highway Commissioner J. S. Parks and the engineering administration of Governor Futral planned extensive concrete construction in Arkansas, it was a mere dream that some day there would be over 13,000 vehicles a day passing through Fort Smith.

For Arkansas was mud. It took a day to drive from Fort Smith to Fayetteville, now a mere 1½-hour drive.

Nonetheless, Commissioner Parks planned with somewhat more than mere brilliance. The day would come, he reasoned, when people would drive from Kansas City to New Orleans; from Oklahoma City to Memphis. Purely on the hypothetical prediction of his dream, they say, old man Parks allocated concrete highways where he figured most of the traffic would go.

Those concrete slabs today are the heavily traveled routes. It would be a deadly affront to a true Arkansawyer to infer that the traffic was just naturally attracted to the higher-type roads because they *were* higher-type, and to this day residents in the seven-county highway district at Fort Smith regard that early planning with admiration.

Time has taken its toll. One of the main routes, U. S. 71, is now beginning to break up. The first sizable job for maintenance crews in the 1950 season consisted of the rehabilitation of a 28.5-mile section of 18-foot pavement that was laid back in 1929.

Rehabilitation methods were a general departure from anything of that nature which has been done in the Fort Smith district before. The concrete pavement was first given special joint attention, the subgrade was strengthened, and the original highway profile was then re-established by several courses of hot-mix asphaltic concrete. In the course of this operation the pavement was also widened to 20 feet.

Severe Pavement Failure

The old road, laid without especial subgrade preparation through hilly country high in colloidal-clay content, had developed extensive failures in the section under consideration. Great cracks split the slab between expansion and contraction joints. Whole sections of subgrade had sunk. Parts of pavement slabs tipped slightly. Practically every expansion joint was pumping, and applications of a soil and cement slurry pumped underneath the pavement had not stopped the trouble. Extensive ground water throughout the area seeped through the fills and occasionally broke out through a pavement joint.

Eugene H. Manley, District Maintenance Supervisor at Fort Smith, pondered the solution with Joe Peters, his District Superintendent. Standard maintenance procedures of the Arkansas Department of Highways were then blended with a few local tricks and the job was laid out in a series of patches, some as long as 2¾ miles.

Joints Get Special Treatment

Instead of cutting out and patching the pumping joints, Manley's men moved right in with an RPB Junior model pavement breaker. Using the breaking tool, the machine tore into the pumping joints and began to break them open about 1 to 2 feet wide. The broken concrete either fell or was tamped down into the huge voids which pumping had developed under the slab.

Local material from the rocky bluffs nearby then came in. It was picked carefully, so that it would be a well graded run of rocky particles up to 12-inch cobbles in size. This rock was dumped in at the broken joints, and a tamping tool was attached to the RPB machine. The joint voids were pounded tight and full of this good material.

At the same time, if obvious ground seeps were intercepted at any of the joints, French drains and vitrified clay pipe were installed to carry the water outside the roadway limit lines.

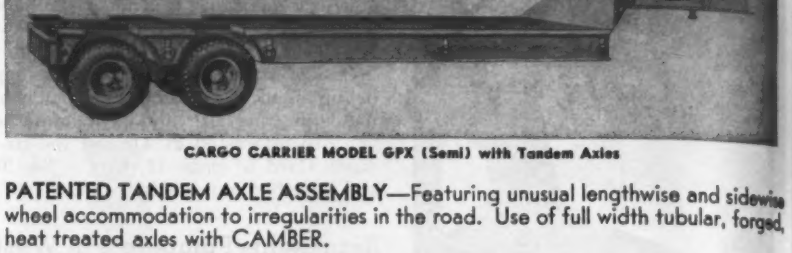
This preliminary strengthening work went on about a mile ahead of the next operation.

Pavement Widened

A 1-foot cutting blade, attached to

(Continued on next page)

SOLVE YOUR HAULING PROBLEMS WITH
A "TRANSPORT TRAILER"
Capacities through 75 Ton—Semi and Full Trailers



CARGO CARRIER MODEL GPX (Semi) with Tandem Axles

PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular, forged, heat treated axles with CAMBER.

FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

TRANSPORT TRAILERS, INC.
TRANSPORTATION ENGINEERING A SPECIALTY
CEDAR RAPIDS, IOWA, U.S.A.

A full Head of Steam
in 30 minutes or less with a
Cleaver-Brooks Mobile Steam Boiler
for pile-driving or extracting

Heavy-duty built to provide fast, dry steam — in dependable and ample supply—hot, dry steam that means less condensate at the hammer—smooth, powerful hammer action — steam that enables operators to drive more piling in less time—that cuts man hours on every job.

Self-contained and MOBILE — easily towed by truck or tractor from job to job — quickly moved from one location to another on the job. Haul it to the job (no crane needed to set it up) — hook up water and steam lines — start burner — and in 30 minutes or less you have a good "head of steam"—ready for work.

No need to bank fires at night — oil-fired — rapid starting — for an early start in the morning. Operates at 30% to 100% of rating without affecting its guaranteed efficiency of 80%.

All-year, all-season usefulness — besides pile-driving and extracting, use it for asphalt plant, ready-mix concrete plant, winter concrete operations and for thawing and miscellaneous heating. Write for bulletin.

CLEAVER-BROOKS COMPANY
390 E. Keefe Avenue, Milwaukee 12, Wis.

- Trailer mounted for easy towing.
- Skid mounted for installation on your truck or trailer.
- Fast Steaming.
- Low-fire start.
- Constant steam pressure through automatic low and high fire control.
- Electric ignition.
- Self-contained fuel tanks.
- All-weather protected.
- Factory finished and tested.
- Choice of gasoline or electric motor.
- Clean, smokeless operation.
- Boiler horsepower—80-125.
- Capacity lbs. of steam per hour (212° F.)—2760-4300.

. . . WITH THE FAMED FOUR-PASS HIGH EFFICIENCY DESIGN OF
Cleaver-Brooks
STEAM BOILERS

SEND FOR bulletin "Modern Pile-Driving and Extracting with Cleaver-Brooks Mobile Steam Boilers" — provides complete data and specifications.

C. & E. M. Photo

In the Fort Smith headquarters office of the Arkansas Highway Department, District Maintenance Supervisor Eugene Manley (left) and Maintenance Superintendent Joe Peters study the plan of a future job.

the moldboard of a motor grader, then widened the roadway by cutting a trench along each edge of the slab. The old slab was 9-7-9 concrete, so the widening trench was cut 11 inches deep to meet general maintenance practices of getting at least 2 inches deeper than the old pavement.

The excess material brought out by this excavation was swept down over the shoulders as a fill-in.

Short sections of pavement, as needed, were then tack-coated with RC-2 asphalt at the rate of 0.15 gallon per square yard. At the same time a new stunt was tried. The shoulders were also primed with a 0.2-gallon shot of MC-O, 6 feet wide. This was done to keep passing traffic, which had to use the shoulders to get by, from throwing dust or mud on the fresh tack coat. According to Manley and Peters, the scheme worked so well they plan to use it often in the future.

The tack and prime coats were allowed to cure for 2 days before cover material came in.

The first cover course of hot-mix consisted of a binder lay, 200 pounds per square yard. This gave about 1¾ to 2 inches of thickness. The binder mix consisted of 1-inch maximum-size aggregate, with about 5 per cent of 70 to 85-penetration asphaltic cement. A commercial Barber-Greene asphalt plant in Fort Smith furnished this material, and trucks had to use covers because the haul was a maximum of 35 miles from the plant. The temperature at the plant was 325 degrees, and rarely did the loads lose more than 35 degrees en route to the point of placement.

The laydown machine was an Adnun Black Top Paver 10 feet wide. The widening strip was laid at the same time as the binder course, by dumping and shoveling slightly ahead of the paver. A Galion tandem steel-wheel machine weighing 10 tons gave this outside strip special attention, and it rolled down evenly with the binder course.

A 1-inch top leveling course completed the show, except that special passes had to be made to re-establish superelevated curves.

The work had not been finished before several local residents, speeding with glee over the unusually smooth patches, went off the road with varying degrees of damage. Motor graders were dispatched immediately to fill in the shoulder break as much as possible. Rock crushers are also scheduled to get started soon, crushing enough material to build smooth gravel shoulders along the pavement.

C. & E. M. Photo

Weed mowing is also on the Fort Smith maintenance agenda. Here's a John Deere mower working north on U. S. 71.

Final costs were modest: about $5,000 less than the $95,307.80 estimate. Actual reconstruction ran $11,300 per mile.

Of the original estimate, labor accounted for $4,266.90. Materials cost $83,432.24, and equipment rental $3,070.20. There was also a 5 per cent allowance for contingencies.

The main materials quantities were 3,960 tons of top-course hot-mix at $6.00 a ton, plus a 28-mile ton-mile

(*Concluded on next page*)

Above: Eight of the 17 trucks operated by the Barnes Brothers, Pipestone, Minnesota.

Right: Roy Barnes, Leo Nesius of Standard Oil, Harry Barnes.

How they *DOUBLED MILEAGE* between overhauls . . .

● When ring sticking and sludge troubles began whittling down mileage between overhauls, the Barnes Brothers of Pipestone, Minnesota, turned to a Standard Oil Automotive Engineer for help. At his suggestion, two bad actors in the fleet of 17 trucks were switched to STANOLUBE HD Motor Oil.

After three months of operation on STANOLUBE HD, the two engines were inspected. *There was no sludge. Rings were free.*

STANOLUBE HD is now used throughout the Barnes Fleet. Ring sticking and sludge troubles have been completely eliminated. An effective preventive maintenance program has been set up by Roy Barnes, equipment superintendent, with the help of the Standard Engineer. The over-all result: Barnes trucks, today, go twice as far between overhauls.

STANOLUBE HD
REG. U. S. PAT. OFF.
Motor Oil

Whether you have a particular lubrication problem or are simply looking for greater fleet economy, a Standard Oil Automotive Engineer can help you. He offers you the finest automotive fuels and lubricants on the market. He has the practical experience and specialized training to help you obtain the maximum benefits from these products. Arrange for his visit, now, by writing to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD

You can be sure you're right if you specify **KERN**

The World's Finest Drafting Instruments
SINCE 1819

"Yours For A Lifetime" is no mere advertising catch-phrase. Kern Drafting Instruments have proved their superiority on the firing line of service for generations. Made with meticulous care from the finest materials, and incredibly accurate, Kern Drafting Instruments are the first choice of professionals, instructors and students the world over. You can be sure you're right if you specify KERN.

A wide selection of models at attractive prices. Write for particulars, Dept. CE.

BORDEN & RILEY PAPER COMPANY, INC.
East 11th Street

Hot-Mix Reclaims Pumping Concrete

(*Continued from preceding page*)

charge of $0.05, and 6,930 tons of base-course material at the same price. Slightly more than the estimated 11,880 gallons of RC-2 were used.

The rehabilitated section will be very carefully watched for a year or so, and if any seeps reappear or joints begin to pump anew, these local spots will then receive additional treatment.

Getting Good Maintenance

The Fort Smith district has had a long, uphill maintenance battle ever since the end of World War II. Starting at that point with obsolete and worn-out equipment, the district has invested in enough new machines so the maintenance battle can be won.

Last year the budget was $536,350 for routine maintenance on 800 miles, plus $751,850 for betterment jobs. The job just finished marks a new beginning in the maintenance and betterment of the district's 185 miles of portland-cement-concrete highways. About 278 miles of asphalt roads are receiving routine maintenance, along with 42 miles of high-type asphaltic-concrete highways.

There are 293 miles of gravel roads remaining, and perhaps more maintenance work has been done on that part of the system than any other, the past year. Extensive gravel is being crushed and spread on this system, to replace that previously lost. While the gravel roads are admittedly not all the district would like to have in their place, they do a real traffic service. With regular blade maintenance, these roads will carry the motorist many miles in comfort.

Will maintenance ever "catch up" at Fort Smith?

Manley and Peters both say "No!" In other words, they go along with the rest of the nation.

River-Pipeline Weights

"Hold That Line With Universal Concrete River Weights" is the title of a 4-page folder prepared by Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio. It describes the company's reinforced-concrete clamps used to stabilize pipelines crossing rivers, streams, and other bodies of water. The River Weights are made in two half-round sections; the heavy clamp-like halves bolt together around the pipe.

The bulletin tells the story of their use by the Texas Gas Transmission Corp. to anchor gas lines crossing the Tennessee River. On-the-job photographs illustrate the crossing operations. Dimensioned drawings show the particular weights used on this job, but the company points out that Universal weights are manufactured in all sizes for pipelines from 12 inches in diameter and up. The folder explains that River Weights reduce original costs by eliminating the necessity of extremely heavy pipe and that they lower maintenance costs by protecting the line from buoying-up or shifting with the current.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 36.

Movie on Welding

"The Oxy-Acetylene Flame—Master of Metals" is a new 20-minute sound and color motion picture on oxy-acetylene welding and cutting; it was produced by the International Acetylene Association and the United States Bureau of Mines. The film explains oxy-acetylene welding and cutting processes. It takes the audience into the foundry and fabricating plant and shows processes used to cut risers on castings, prepare H and I-beams for heavy steel construction, etc.

Animated sequences show the production of calcium carbide and acetylene, and explain why oxygen and acetylene combine to make "the hottest flame on earth". The workings of welding torches, cutting torches, and oxygen and acetylene regulators are also shown by animation.

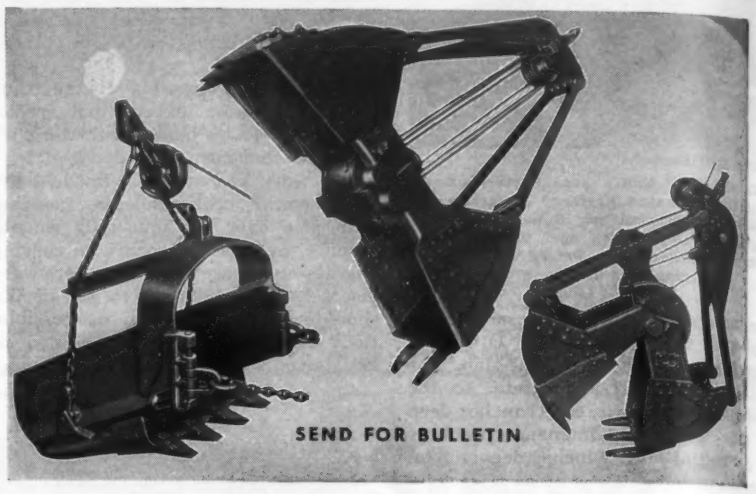
Requests to borrow copies of the film should be addressed to the Supervising Engineer, Graphic Services Section, Bureau of Mines Experiment Station, 4800 Forbes St., Pittsburgh 13, Pa. If you would like to own a copy of the film, write to The Secretary, International Acetylene Association, 30 E. 42nd St., New York 17, N. Y.

Power Steering Boosters

A 4-page catalog citing the features of hydraulic-power steering boosters for use on Four Wheel Drive trucks has been prepared by the Garrison Mfg. Co., 1506 Santa Fe Ave., Los Angeles 21, Calif. These units are said to increase the flexibility of the trucks, provide additional safety, simplify turning, reduce driver fatigue, and cut down on front-axle and steering-gear wear. Closeup photos of the Garrison boosters are provided, along with a drawing of the power cylinder and control-valve assembly for the FWD Model Y4 front axle.

A circular describing the application of the boosters for International wheel-type tractors is also available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 65.



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Weighs only 12 Lbs.
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A standout for price, power, performance, quality and easy handling, this new, light-weight 8½" MallSaw has a capacity of 3" on straight cuts. With Bevel-Depth Shoe attached it will make straight cuts from 11/16" to 3"; and 45-degree bevel cuts 5/16" to 1⅞".

Choice of right or left combination blade, 115V or 220V AC-DC motor. Blades are available for dadoing, grooving tile, transite, concrete and cutting light gauge metals. Other models with 2" to 4½" capacity.

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A self-priming centrifugal pump designed without valves—Goulds Pumps, Inc., makes it.

A Valveless-Design Self-Priming Pump

A new line of self-priming centrifugal pumps has been announced by Goulds Pumps, Inc., Seneca Falls, N. Y. All valves are eliminated in the new unusual design. The pump has positive self-priming, no large and bulky priming reservoir, no recirculation of water during pumping stage, and efficiencies comparable to standard centrifugal pumps, according to the manufacturer.

Made in sizes from ¼ to 5 hp with both open and closed impellers, these pumps have capacities to 120 gpm, heads to 135 feet depending on capacity, and suction lifts up to 25 feet.

Further information may be secured from the company by requesting Bulletin 636.1. Or use the Request Card at page 16. Circle No. 87.

Meter Now Measures In Feet and Inches

A new counting device on the Shalda measure meter now enables measurements to be taken in feet and inches, rather than feet and tenths of feet, according to an announcement by F. D. McGirr & Associates, P. O. Box 1483, Beverly Hills, Calif. The counting device for the Model D-1 was developed by the Veeder-Root Co.

Basic features of the new model are the same as those of standard models; it can add and subtract, measure straight lines or curves, while the user pushes or pulls it along. The meter is said to be accurate to 0.1 per cent and is able to record up to 10,000 feet. It can run up a wall to simplify taking cubic measurements.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 72.

A Rosin Wood Preserver

A circular on Pinola, a liquid rosin wood preserver, is available from Pinola Products, Inc., Savannah, Ga. The folder points out that the product may be applied by brush, spraying, or dipping methods; that it penetrates wood, seals the pores, and hardens the surface; that it forms a tough coating which excludes moisture and thereby extends the life of the structure; that it protects against termites, ants, wood borers, and other insects. The folder suggests its application for fence posts or other wood structures in contact with the ground, and for timber used in bridges, home construction, docks, piers, and other waterfront structures.

The company performs preservative treatments for large quantities of wood. These include a dehydrating and impregnation of crude lumber for use in bridge, pier, and building construction.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 70.

Features of Plastic Pipe

A pocket-size folder outlining the features of plastic pipe has been prepared by Carter Products Corp., 10157 Meech Ave., Cleveland 5, Ohio. It also covers the applications and specifications of this noncorrosive product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 127.

Crawler-Tractor Catalogs

Two new catalogs on International TD-14A and TD-18A crawler tractors have been issued by the Industrial Power Division of the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. Both have 24 pages and are illustrated in two colors. On-the-job photographs show the tractors in operation, while sectional views and diagrams point up their features. Complete specifications and detailed descriptions are given for each model.

This literature may be obtained from the company by requesting Catalog A-153-NN for the TD-14A and Catalog A-154-NN for the TD-18A. Or use the Request Card at page 16, circling No. 153 and No. 154 respectively.

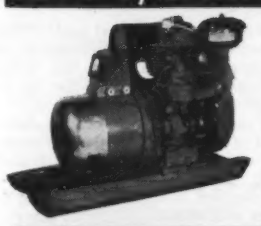
On Jacking Equipment

A new 12-page catalog, No. 317, issued by Rodgers Hydraulic, Inc., Minneapolis 16, Minn., describes a full line of hydraulic jacking equipment ranging in capacity from 52 to 600 tons. This equipment includes jacking cylinders, hand and power pumps, quick-couplers, valves, and hose. Each model is fully described and illustrated. Specifications and engineering data are included for each.

The folder highlights the application of Rodgers hydraulic power equipment for jacking tunnel shields, pointing out that it may also be used for jacking compressed-concrete pipes, corrugated pipes, or well casings. The hydraulic cylinders are available in various capacities and lengths of ram travel, for use with either hand-operated or power-driven hydraulic pumps. The cylinders may be operated singly or as a group for straight jacking.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 74.

SAVE 1/3 ON PORTABLE ELECTRIC PLANTS



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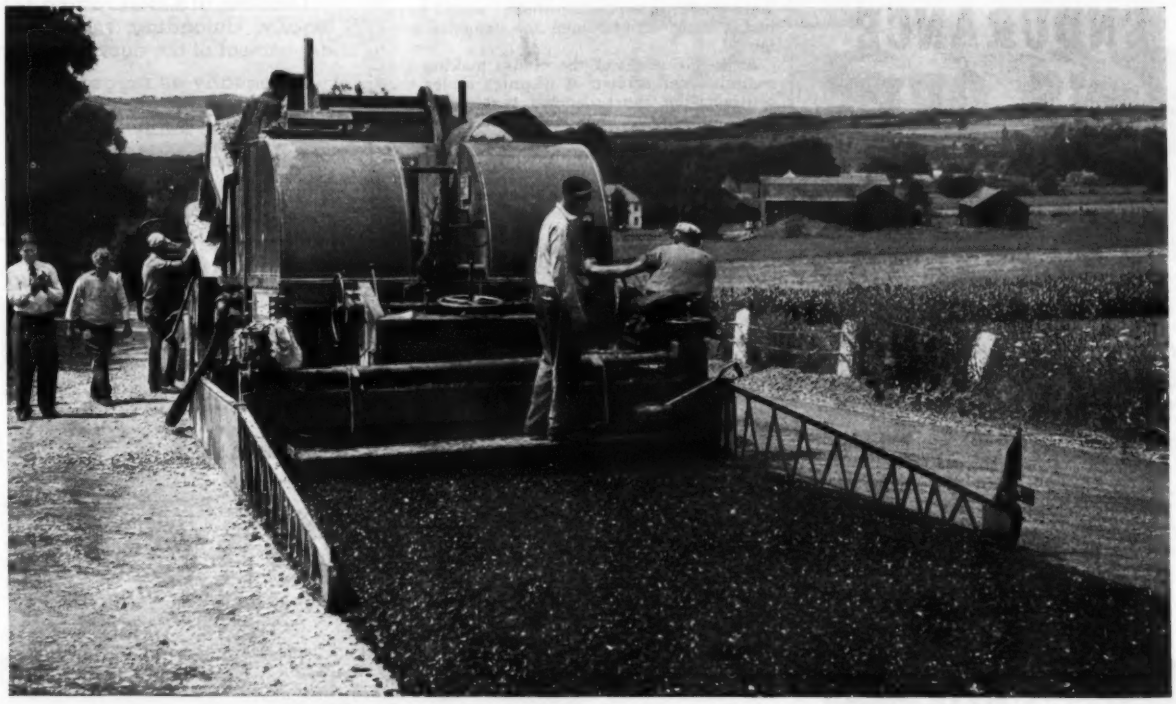

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Moto-Paver uses beach sand, gravel, crushed stone or slag aggregates and various bituminous materials, including tars, cutback asphalts, road oils and emulsions. Road speeds up to 25 miles per hour make it possible to move the Moto-Paver from one job to another in a minimum of time.

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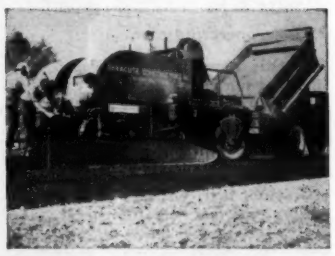

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

City Delays Bridge Contract

THE PROBLEM: *An old but noteworthy case involved a contract to build a bridge superstructure "on the present stone piers, and to connect the same with the ironwork of the anchorage". Work was to begin on one week's notice from the city street commissioner and was to be completed within ten months thereafter. A clause called for per diem damages for failure to finish the job within that time. Another clause made the commissioner exclusive judge of "all questions which may arise relative to the contract on the part of the contractor".*

The piers were not ready to receive the superstructure until eleven months after the commissioner gave notice to proceed. The contract work was completed less than eight months after the piers were ready. (1) Was it incumbent upon the city or the contractor to complete the piers? (2) Did the commissioner have a right to rule that per diem damages were deductible from the contract price?

THE ANSWERS: (1) The city bore the duty. (2) No. (King Iron Bridge & Mfg. Co. v. City of St. Louis, 43 Fed. 768, decided by the U. S. Circuit Court, Eastern District of Missouri.)

On the first question, the court said: "There can be no doubt that the duty rested on the city to construct and prepare the bridge piers. . . . The contract . . . did not by any provision obligate the plaintiff to do any work on the piers. It is a necessary inference from all of the terms of the agreement that the city undertook to provide such stone piers."

The court decided that the clause for per diem damages was eliminated from the contract because the city did not furnish the piers until after the time set by the contract for completion of the work. But the court did recognize that had the city claimed, which it did not, that there was unreasonable delay in completing the job after the piers were ready, it is possible that it would have had a valid counterclaim for damages sustained.

As to the effect of the clause making the commissioner arbiter of disputes under the contract, the court decided that, acting in good faith, the commissioner could determine the amount of work done, and whether the work conformed to the drawings and specifications. "But," declared the judge, "the question which the street commissioner undertook to decide was purely a question of law, as to the effect which the failure of the city to have the bridge piers completed within one week and ten months after the notice was served had upon its right to demand liquidated damages. . . . The contract, properly construed, did not commit that question to the determination of the commissioner."

Limits on Municipal Power to Award Jobs

THE PROBLEM: *Under Massachusetts statutes could a town obligate itself to pay a larger sum for rebuilding a street than had been appropriated for that purpose?*

THE ANSWER: No. (Duff v. Town of Southbridge, 90 N. E. 2d 12, decided by the Massachusetts Supreme Judicial Court.)

The statutes forbid towns and cities of Massachusetts other than Boston to incur liability for a given purpose in excess of funds appropriated for that purpose, except in certain emergencies involving the public health or safety of persons or property. In line with what the court had previously declared in other cases, and what courts in other states with similar statutes have held, it was decided that persons dealing with a municipality are bound to take notice of such statutory limitations upon municipal contracting power, and that they cannot collect on contracts attempted to be made in violation of the statutes. "One purpose of this statute is to set rigid barriers against expenditures in excess of appropriations."

Material-Source Change Did Not Change Contract

THE PROBLEM: *Defendant construction company sublet to plaintiff the excavation and haulage of materials from an indefinitely described area. Excavation was begun at Pit No. 1 within that area. But operations were shifted, under an oral agreement, to Pit No. 2 near by, which involved shorter haulage. Nothing was said about readjusting the subcontract price, and as the work progressed defendant paid plaintiff the same rate as for haulage from Pit. No. 1. The contract called for written modification if there should be a material increase or decrease in the amount of work to be done. In the final settlement, was defendant entitled to reduce the price for haulage because of the shortening of the distance?*

THE ANSWER: No. (Herzog v. Henry H. Horst Co., 72 Atl. 2d 131, decided by the Pennsylvania Supreme Court.)

The court applied the fundamental rule of law that where the meaning of a contract is doubtful on a given point the doubt will be settled against the party who chose the contract language—in this case the prime contractor. The court also thought that the fact that the contractor did not make timely claim

(Concluded on next page)

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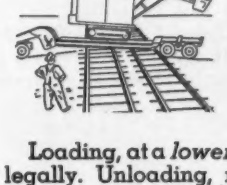

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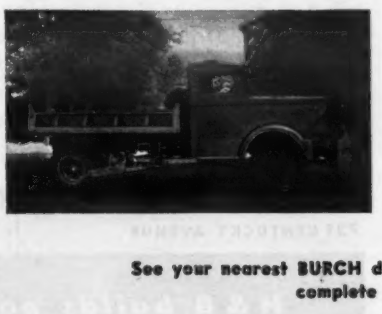

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that it was entitled to reduction in the haulage price and demand a written modification of the contract indicated its understanding that Pit No. 2 was within the area intended to be described in the original contract.

Lack of Road Detour Sign Was Expensive

THE PROBLEM: *A motorist traveling a road under construction, at a point where a bridge was being constructed, did not see a detour near the gap and was thrown into a ravine. He was injured and his car demolished. In court he said he had not seen the detour because of dust stirred up by a car just ahead of him, and there was no detour warning except a barricade immediately in front of the gap.*

The construction contract required the contractor to "maintain acceptable warning and detour signs". Was the contractor liable for injury to the motorist and demolition of his car?

THE ANSWER: Yes. (McGeorge Contracting Co., appellant-defendant, v. Mizell, plaintiff, appellee, 226 S. W. 2d 566, decided by the Arkansas Supreme Court.)

The court said that it was a close question whether or not plaintiff, the motorist, was guilty of carelessness that contributed to his own injury. But it held that the jury's conclusion that the contractor's fault was the real cause of the accident was supported by evidence and therefore could not be set aside.

This case and other similar ones that have been mentioned in these columns indicate that detour signs and warnings are often placed too close to danger points to be efficient in guarding against accidents.

Unsuccessful Waterworks Bidder Upsets an Award

THE PROBLEM: *Under New York statutes, could a company as an unsuccessful bidder for town waterworks construction maintain suit to annul an award to another bidder and compel an award to the company? Was the successful bidder a necessary party to the suit?*

THE ANSWERS: Yes. (Application of Cestone Bros., Inc., 95 N. Y. Supp. 2d 170, 172, decided by the New York Supreme Court, Appelate Division, Second Department.)

The decision was based upon special facts and statutory provisions. It is not to be regarded as out of harmony with many court decisions to the effect that under legally reserved power to determine who is the lowest *responsible* bidder for a job, a public board is not necessarily bound to award a contract to one bidding the lowest price. As interpreted by the New York Court of Appeals (287 N. Y. 491, 41 N. E. 2d 68) an unsuccessful bidder's right, under the statutes of that state, to compel an award in a special mandamus proceeding depends upon his having been illegally deprived of the award.

The Appellate Division explained that the successful bidder was a necessary party to the litigation because the town had a right to have the validity of the award settled in one suit rather than be compelled to litigate in separate suits the respective rights of the successful and unsuccessful bidders.

Contracting Officer Should Be Impartial, Says Court

THE PROBLEM: *If the Government's contracting officer grossly erred in his findings as to the measurement of excavation performed by a contractor and as to what was a fair price for driving a conduit, was the United States Court of Claims bound by the findings in the contractor's suit for more pay?*

THE ANSWER: No. (Penner Installation Corp. v. United States, 89 Fed. Supp. 545, decided by the Court of Claims.)

The court noted that this was a case where facts were involved, not governed by the recent decision of the United States Supreme Court (Moorman v. United States, 338 U. S. 457, 70 S. Ct. 288) that a contracting officer's decision, made in good faith, concerning the meaning of a contract and spex, is final.

The court pointed out that in another case (Ripley v. United States, 223 U. S. 695, 32 S. Ct. 352) the Supreme Court had declared that before any decision of a contracting officer can be final, it must have been rendered "with due regard to the rights of both of the contracting parties".

"Some contracting officers," said the Court of Claims, "regard themselves as representatives of the" Government, "charged with the duty of protecting its interests and of exacting of the contractor everything that may be in the interest of the Government, even though no reasonable basis therefor can be found in the contract documents."

When Is Work "Satisfactory"?

THE PROBLEM: *A subcontract to lay a sewer on a Federal project was referred to in a memo handed by the prime contractor to the sub. The memo stated that the agreement could be "terminated by either party on five days' notice if it proves unsatisfactory". After the work had been partly performed, the prime contractor cancelled and finished the work himself. Was the subcontractor entitled to damages based on loss of profits where it appeared that there was no ground for dissatisfaction with his work?*

THE ANSWER: Yes. (D. W. Winkelman Co., Inc., v. Barr, 176 Fed. 2d 341, decided by the United States Court of Appeals, Sixth Circuit.)

Because the contract was to be performed in Tennessee, the court said that the case was governed by decisions of the Supreme Court of that state. Those decisions were to the effect that while one has an absolute right to determine for himself whether a thing furnished him is satisfactory where personal feelings, taste, or sensibilities are involved, that is not true "where a contract involves operative fitness or mechanical utility". In such cases a contract is satisfactorily performed if a reasonable man ought to be satisfied with it.

Lien Waiver Not Binding

THE PROBLEM: *Private construction contracts partly typed contained this printed clause: "The contractor hereby waives his lien for work, labor, and services and materials furnished." Did the contractor waive a lien under a New York statute which says that a contractor, subcontractor, material man, or laborer may not waive his right to a lien, "except by an express agreement in writing specifically to that effect signed by him or his agent"?*

THE ANSWER: No. (MacArthur Concrete Pile Corp. v. Kew Queens Corp., 92 N. Y. Supp. 2d 200, decided by the New York Supreme Court, Kings County.)

The court does not clearly state its reasoning in this case, but the opinion indicates that the court did not regard the printed clause as a specific written agreement waiving a statutory lien right. It was decided that it would be against public policy to recognize such an advance waiver as binding.

Third Party Sues on Bond

THE PROBLEM: *A municipal contractor gave a bond that was so worded as to make the contractor liable for damage to a third party's property in blasting. The city did not require that so broad a bond be given and there was no law requiring it. Was the third party's suit to collect damages under the bond properly dismissed?*

THE ANSWER: Yes. (Juliano v. Circle Construction Corp., 95 N. Y. Supp. 2d 824, decided by the New York Supreme Court, Appellate Division, Second Department.)

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A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit.

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CP Hicycle Vibrators run at a constant speed of 10,000 v.p.m., the most suitable frequency for concrete placement, and will handle 30 to 40 cubic yards an hour of 2" slump concrete.

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Reservoir Sealed, Earth-Lined

By RAYMOND P. DAY,
Western Editor

Cotton-Reinforced Asphalt Membrane, Filter Blanket, And Dense Earth Will Prevent Leaks in Sandy Gravel

✦ CONSTRUCTION of a 300,000,000-gallon water storage reservoir in Baldwin Hills, near Los Angeles, called for everything unusual. The job was easily the outstanding one of the winter in southern California. With competition so keen that contractors on nearby work were at each others' throats, the Baldwin Hills Reservoir drew only five bids.

Kemper Construction Co. of Los Angeles was the lucky or unlucky low bidder, depending on the point of view. The company is now hurrying the project along, and it is expected that by October 31, 1950, the $1,111,000 reservoir will be ready for the Department of Water & Power of the City of Los Angeles.

Consolidation of earth to exceptionally high densities with special rollers was only one of several accomplishments. A patented vacuum method of injecting moisture into the earth borrow was tried successfully. A special manufacturer-built machine blended earth and moisture at the lining fill. The imaginative, inventive genius of Contractor Kemper paid off when he designed and built another special rig to spread gravel on slopes. A tough cotton-reinforced asphalt lining was built and maintained without punctures in order to make the seal watertight.

First Problem Is Design

The Baldwin Hills Reservoir was of necessity located in a tricky, pervious formation, cut by fault zones. Designers battled the initial problems because they had to come up with a water vessel which would hold its load without leakage, in spite of sandy gravel all around. With part of the reservoir subgrade compacted and part uncompacted, design was difficult and unusual.

The answer to these problems is a reservoir unique in conception. The lining extends on bottom and sides. Composed of a tough asphalt seal about ½ inch thick, plus compacted earth, previous concrete, and pavement, it ties in to a series of drains which catch what little moisture will reach the asphalt.

The asphalt membrane lying next to the original excavation is topped by 4 inches of pervious cemented gravel and from 7 to 10 feet of highly compacted earth-fill lining. An asphaltic-concrete pavement, laid over the earth lining, is designed principally for wave protection.

Fluctuating water levels will be characteristic when the reservoir goes into service, for the basin is a quick-demand pressure-regulating device to take care of peaking loads. Water will come from Owens Valley in the Sierras.

Dirt Subcontracted

Approximately 500,000 cubic yards of earthwork was subbed to John Blakemore, a grading contractor of Monrovia. Blakemore had also handled some of the force-account earthwork done two years ago by the Department of Water & Power. At that time the reservoir area was roughed in, and a high earth dam was built across a deep canyon at the north end of the site.

Dirt for the 10-foot earth lining was stockpiled at that time, and Blakemore's grading equipment shuttled it to the reservoir at high speed. The stockpiled dirt dried out over the months, however, and moisture was considerably below the desired limits.

R. R. Proctor, engineer and originator of the famous soil-compaction technique which bears his name, was in charge of the design at Baldwin Hills. Perhaps it was inevitable that something unique should be done with soil. A stunt was tried which had been used successfully on other Department jobs. The tight material in the stockpile was made to breathe; to suck in its own water content!

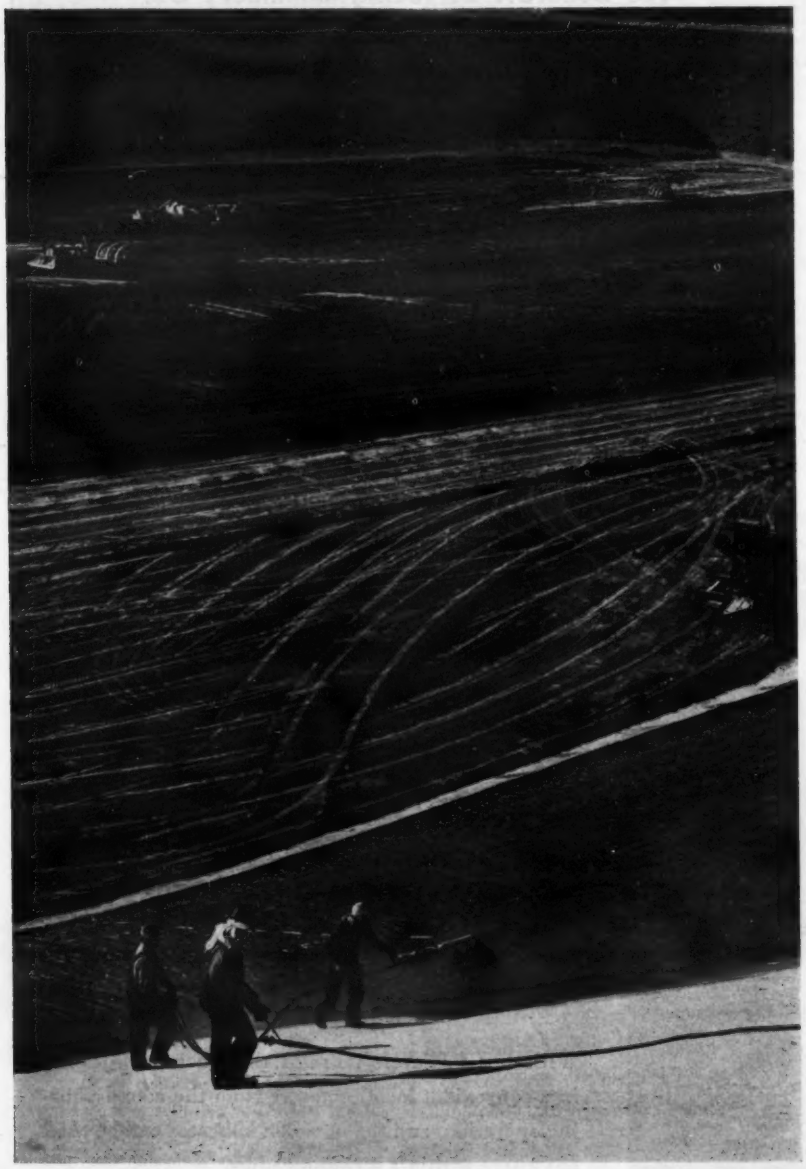
Well drill holes went down on 40-foot centers to an average depth of 35 feet. Cased with iron pipe, the holes were hooked to a common vacuum manifold. For several weeks 16 inches of suction was maintained. The vacuum at the bottom of the stockpile drew sprayed water down through the dirt. When the unusual process was completed, the stockpile had most of its moisture content.

The stockpile was mixed in place by a Northwest 80-D power shovel, which pulled its dipper up through the layers of material. Selected fines from the reservoir excavation had been hauled in in 12-inch lifts at the time the pile was made, because most of the native formation was pervious. The shovel mixed these materials roughly, so that each load which went to the reservoir would have all its components, even though further blending was planned.

Stockpiled dirt was shuttled over a 1,000-foot haul by six Super C Tournapulls, which also excavated part of the reservoir. Six Caterpillar D8's helped out on dirt work, either by handling dozer blades or pulling sheepsfoot

(*Continued on next page*)

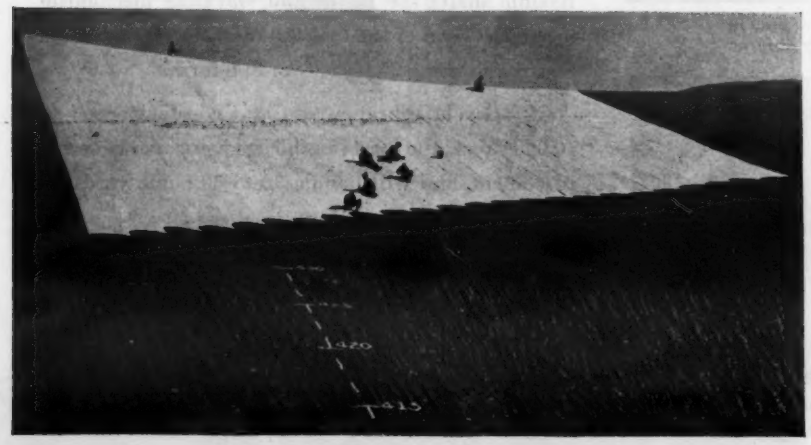
C. & E. M. Photos



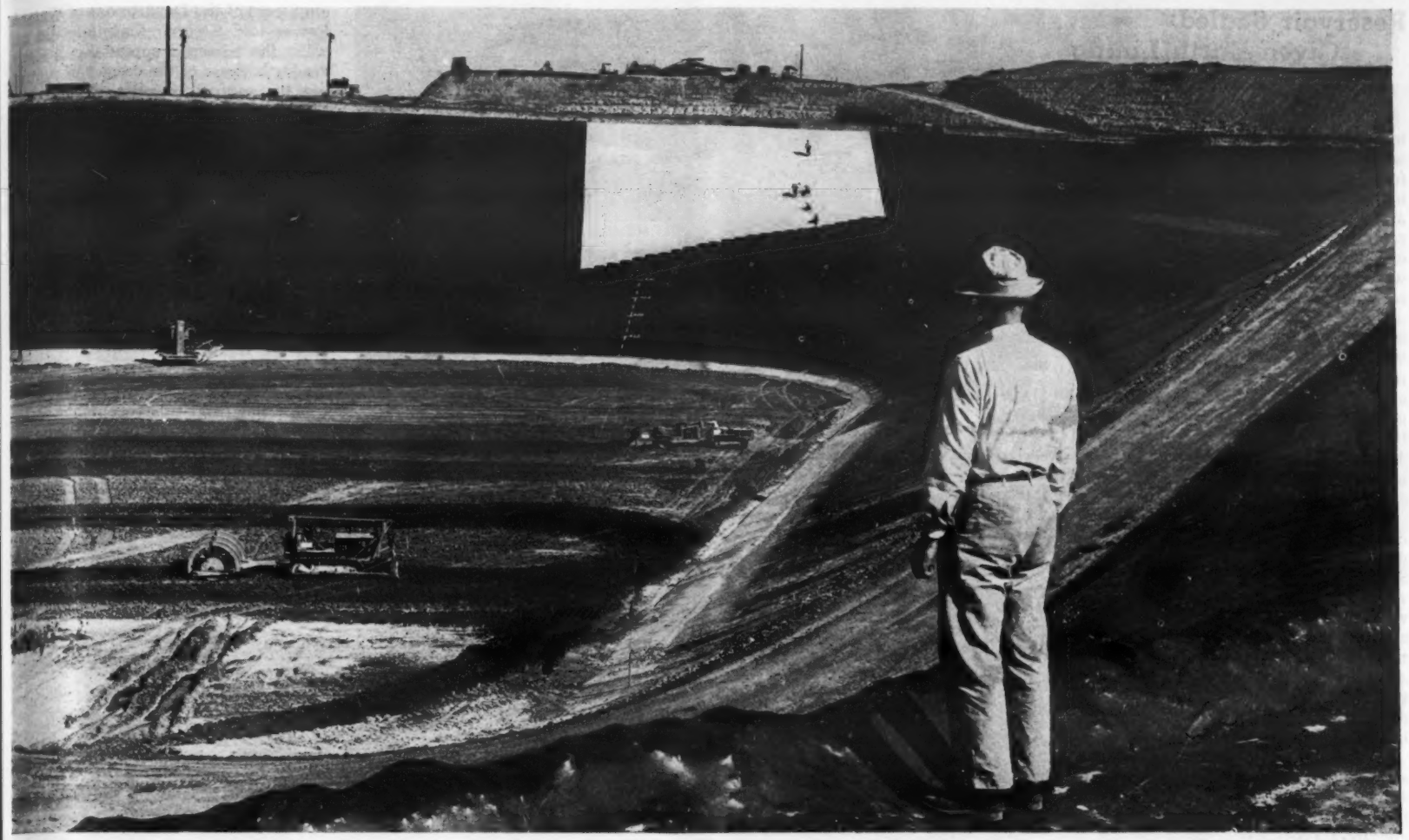
A tough asphaltic lining about ½ inch thick is designed to make Baldwin Hills Reservoir totally impervious to seepage despite sandy gravel and fault zones at the site.

This closeup of cotton reinforcing also shows a typical trench to hold the 4-inch clay pipe which will collect any water which percolates through the heavy upper lining.

Parts of the asphaltic lining required reinforcement, especially where shifting soil conditions were found. Cotton strips 5 feet wide were nailed up and down the slopes.



Here Kemper Construction Co. workmen apply the asphalt on a side of the reservoir from a hand-held spray outfit. The hose leads up to a tank truck on the top of the bank.



Bruce Kemper, who is superintending the $1,111,000 Baldwin Hills Reservoir job for his father, looks down at his men and machines. Completion is scheduled for the end of next month.

tampers. An International TD-24 tractor belonging to Harry Hicks of San Gabriel saw some pusher service, as did some of the D8's.

Spectacular Bank Sloping

Sloping the 2 to 1 banks was done by conventional No. 12 Caterpillar motor graders in a spectacular display of versatility. The machines worked longitudinally with the slope. A cable, tied between the motor grader and a D8 Caterpillar on top of the bank, prevented the lower machine from tipping.

Tough Asphalt-Membrane Lining

A tough asphaltic lining, designed to make the water receptacle absolutely impervious to seepage, was built down the sides and across the bottom of the reservoir. Reinforced by cotton material where necessary, the asphaltic lining was carefully prepared. Generally speaking, it was about ½ inch thick when completed.

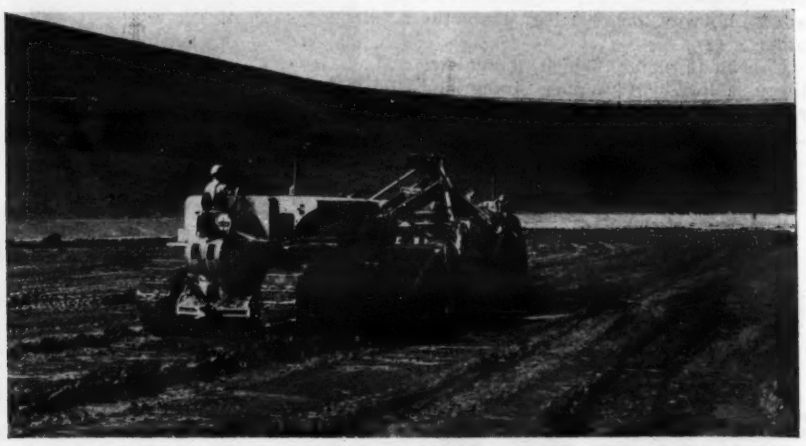
Extensive priming work preceded its construction. SC-1 and SC-2 prime asphalt went in first. Of the total amount of prime oil used, approximately 70 per cent was SC-2.

The application of prime oil varied from one section to another because of the differences in material. In several clayey sections, one prime shot was sufficient. On the other hand, some of the pervious sandy spots required three prime applications before the slopes were sufficiently saturated. The amount of oil in priming work varied from 0.3 to 0.55 gallon per square yard for each application. SC-type oils went in at a temperature of approximately 325 degrees, from distributors owned by the oil company which supplied the asphalt. A small amount of SC-6 was used, but it was the exception rather than the rule.

(Continued on next page)

Kemper built his own rig to place 4 inches of pervious concrete over the asphalt membrane without rupturing it. It travels 8 fpm and lays an 8-foot course on the slopes.

Over the concrete went a light course of pneumatically applied concrete. Subcontractor F. W. Case used a Schramm 315-cfm compressor, Rex 7-S mixer, and a Gunite gun.



From 7 to 10 feet of highly compacted earth-fill lining tops the concrete. Here in the bottom of the reservoir, a Super C Tournapull and a D8 take excess dirt away.

A 7-foot Seaman Pulvi-Mixer drawn by a D4 blends earth to mix the moisture uniformly and break up clods. Sheepsfoot rollers and an RPB tamper did the compacting.

Reservoir Sealed, Given Earth Lining

(*Continued from preceding page*)

Many parts of the asphaltic lining required reinforcement, especially where shifting soil conditions were found. This reinforcement was placed in the asphalt to give added strength and toughness in the same way that reinforcing steel adds to the strength of concrete. Methods of construction were the same, otherwise, for both reinforced and unreinforced sections.

The first coat of asphalt on the primed surface was an SC-6 asphalt or a 40 to 50-penetration asphaltic cement, depending on the soil condition. The first shot went in at an average rate of 0.3 gallon per square yard. SC-6 temperature was 420 degrees; asphaltic cement 450. The asphalt was applied through long flexible hose and a hand-held spray outfit.

Following the first coat of asphalt, cotton material was applied where necessary. This material, furnished by Spartan Mills in Spartansburg, S. C., was a special strong cotton cloth 5 feet wide and put up in long rolls. Its weave consisted of 30 strands per inch longitudinally, with 20 strands per inch of somewhat heavier thread running transversely. It was installed up and down the slopes, and tacked down with heavy nails.

The next coat of hot asphalt consisted of 0.4 gallon per square yard of 40 to 50-penetration AC. This coat impregnated the cotton reinforcement and built up the general thickness. A final application of 0.3 gallon just before construction of the pervious-concrete blanket completed the asphalt work.

While the use of a total amount of 1 gallon per square yard was general, this figure varied in some spots because of peculiar ground conditions.

Drainage System Built

An extensive water-collection system, made up of 8,000 feet of 4-inch open-joint clay pipes, was put in immediately above the asphalt membrane in the bottom of the reservoir. The drainage system was installed in shallow trenches which were about 100 feet apart one way and 500 feet apart the other.

Collected water which percolates through the heavy upper lining and reaches the drains will pass across a series of 8 weirs, located in the outlet structure, so the engineers can measure the seepage and spot any future trouble with the lining, if any should develop there.

C. & E. M. Photo
A father and son team talk things over—M. F. Kemper and his son Bruce, superintendent for the Baldwin Hills Reservoir.

Pervious Concrete Unusual

Placement of 4 inches of special pervious concrete on top of the asphalt membrane was one example of how contractor ingenuity pays off. When the engineers of the Department of Water & Power told Kemper that they did not want the material spread by a motor grader because of the danger of rupturing the asphalt membrane, they suggested no alternates.

Kemper solved the problem by designing and building a spreader which would lay the material down evenly and gently.

The machine was built on the frame of an old Barber-Greene trenching machine, using its tracks and power assembly. A receiving hopper was installed on the front end so trucks could dump their loads. A double-bucket Link-Belt elevator was put in to take material from the receiving hopper and carry it to a 3-yard storage hopper with a clam-gate bottom opening.

Material from this receptacle passed to a variable-speed conveyor belt run by a hydraulic gear motor, and dumped into a strikeoff hopper with a screw conveyor. This screw system of distribution eliminated the possibility of

(*Concluded on next page*)

Painted a gleaming white, Safety-Beam stands out boldly against Vermont's rolling hills.

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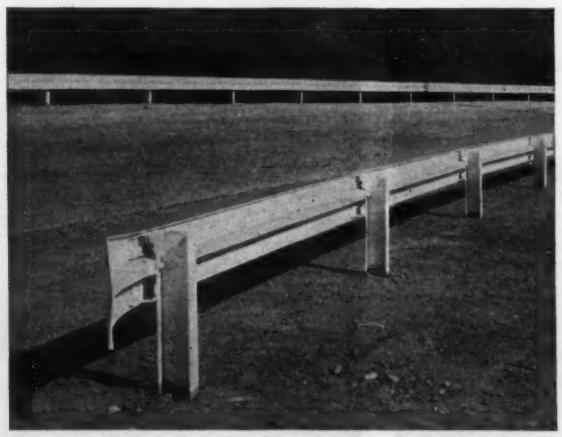

Rear and front views of Safety-Beam on highway in Pennsylvania.

Safety-Beam is easy to install, as it fastens to post with one bolt.

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Two features make Bethlehem Safety-Beam Guard Rail ideal wherever extra protection is required: (1) great strength, and (2) ability to absorb impact. This husky rail consists of strong sections of steel plates, bolted together securely to form a continuous, impact-absorbing beam. When vehicles strike Safety-Beam, impact is distributed along the rail, making it next to impossible to crash through the rail and off the shoulders. In most cases, runaway vehicles are deflected parallel to the rail.

EASY TO INSTALL

Safety-Beam Guard Rail means real economy, because it can be installed quickly, even by unskilled labor. It fastens to the post with one bolt. There's no need for end anchor rods, special tools or complicated adjustments. Safety-Beam is easily visible too, even at night. It is regularly furnished in 12 ft, 6 in. lengths, and in longer lengths for special requirements.

Folder 545 includes standard details and assembly plans for Bethlehem Safety-Beam Guard Rail. The nearest Bethlehem sales office will be glad to supply a copy. Or send your request to us at Bethlehem, Pa.

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fracturing the asphalt. Traveling 8 fpm, the machine placed 4 inches of material in an 8-foot course. It was especially useful on the reservoir slopes. Working from the compacted-earth lining at any given point, the machine kept a course ahead of the earthwork.

The porous concrete for this mixture is a cemented pea gravel, tied together by 1½ sacks of Type II monolith cement per cubic yard. Consolidated Rock Co. delivered the pea gravel to the job, where it was mixed with cement and water through a small portable batch plant and a 34-E Foote paver. Dump trucks hauled it out to the special machine which spread the material. A Link-Belt K-360 crane, working with a widened laydown concrete bucket, spread the porous concrete in the reservoir bottom.

After the pervious concrete was in, it was sealed by a light application of pneumatically applied concrete. F. W. Case Co. of Los Angeles subbed this work, using a self-contained mobile unit and a Schramm 315-cfm compressor. The mobile unit consisted of a truck frame, a Rex 7-S mixer, Gunite gun, and a 500-gallon water tank.

High-Density Earth Lining

Placement of the 10-foot blanket of dense earth lining also called for special machines. Special equipment was used both for blending the material and for compaction.

A 7-foot Seaman Pulvi-Mixer was the first of the special machines. Drawn by a small D4 Caterpillar tractor, the Pulvi-Mixer was used to blend the earth, to mix moisture uniformly, and break up clods. The machine has a special heavy-duty, high-speed Fuller transmission which permits its General Motors diesel engine to drive the heavy curved tines at an appropriate speed. When the machine goes to work, the tines bite down so deep that little pull is required from the D4 to move it along, owing to the forward thrust which is developed.

Field changes on this rig included a plow ahead of the frame to help the machine bite down and get penetration with its tines. This also called for a slight revamping of the hydraulic gear to give a longer stroke as the tines went down into the dirt. One pass by this machine was usually sufficient to blend the soil, but more passes were made if necessary.

Two special Southwest sheepsfoot rollers also contributed their bit toward the high densities. They are deceptively small; only 48 inches in diameter. But the roller shell of steel is 3 inches thick, and the teeth are so spaced that 1,000 pounds per square inch of compactive effort is developed. Also they were loaded with heavy sand and the total weight was over 40,000 pounds.

The deceptive appearance of the rollers caused at least one man quite a shock. The truck driver who hauled the rollers from Alhambra to the job thought the riggers were crazy when they hoisted each tamper with a 3-part line. But when he tried to get up the grade on the haul road to the reservoir, he knew he had a load. "I went from one gear to another, and finally down into super low. And it looked doubtful at that!" he said.

From 16 to 20 passes were required to compact the earth to the high density necessary. Ordinarily the earth was put down in layers from 4 to 6 inches thick.

The earth lining is approximately 30 feet wide, measured off the slope the way machines work. It was put in by making a constant spiral around the sides of the reservoir until the top was reached.

Compaction of earthwork in the confined space around the outlet structure was also a tough problem. The sheepsfoot rollers couldn't get in there, and ordinary hand pneumatic tampers compacted less than 3 cubic yards per man per day. This was of course no reflection on either the men or the machines. Density requirements were simply much higher than ordinary.

Use of an RPB pavement-breaker cylinder, fitted with a tamping shoe about 16 inches square, jumped the per-man production to 30 cubic yards. The RPB tamper was suspended from a crane boom while it worked.

Personnel

Field operations for the contractor were under the direction of Bruce Kemper. John Blakemore supervised his own subcontract, and Frank Holloway took care of Warren Southwest's asphalt subcontract. Loring Tabor was supervising Engineer of Inspection reporting through Norman Imbertson to R. R. Proctor in charge of major construction projects of the water system.

Samuel B. Morris is General Manager and Chief Engineer of the Department of Water and Power. Laurance E. Goit is Chief Engineer of the water system.

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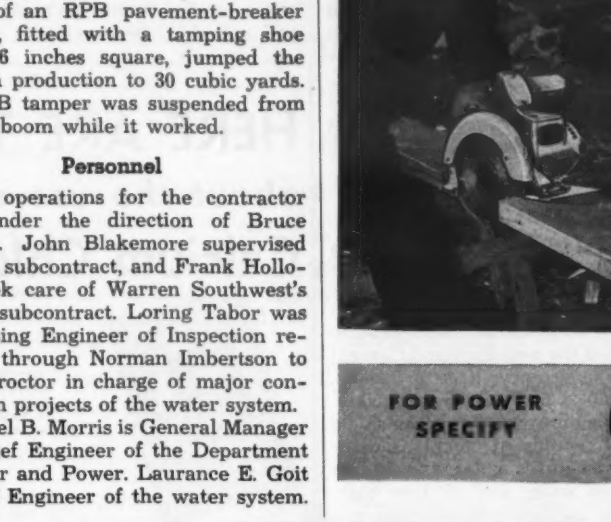

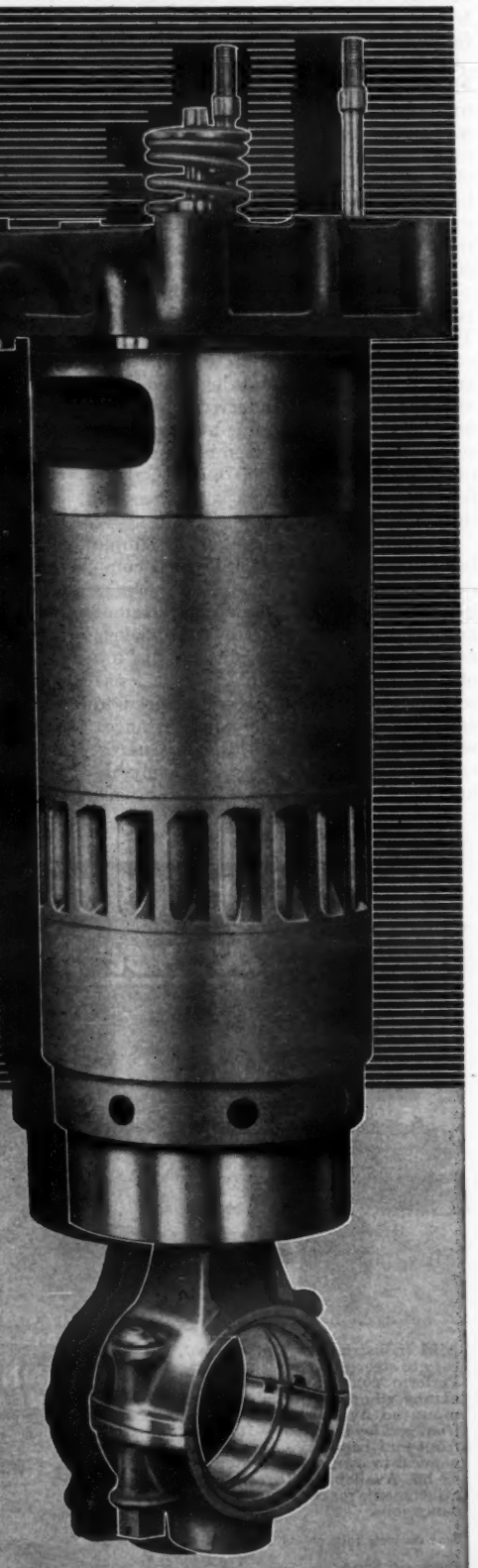

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Safway light-duty 4 x 4 steel scaffolding may be assembled in scaffolds or towers 40 feet high.

Steel Scaffolding

Welded tubular steel scaffolding for light-duty construction and maintenance is announced by Safway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis., to supplement its standard and heavy-duty equipment. It is known as Safway 4 x 4 steel scaffolding because the basic end frame members measure 4 feet wide x 4 feet high. The steel scaffolding is designed to replace wood trestles or horses and wood pole-and-crossbar scaffolding for many light-duty applications, thereby eliminating nails, splintering, and fire hazards. The parts may be assembled in scaffolds or towers as high as 40 feet, and to take loads not exceeding 50 pounds per square foot.

Members are made from high-carbon steel tubing welded in a rigid design. The standard 4 x 4 end frames are certified to 4,000-pound uniform load and 16,000-pound total leg load, and are approved by Underwriters' Laboratories, Inc. In use, this new portable scaffolding may be assembled or dismantled without special tools. Only a few types of standard parts are needed, the company says.

On the ground, the legs rest on simple base plates or screw jacks which compensate for uneven terrain. To increase scaffold height, additional end frames are installed by slipping the tubular legs over integral coupling pins on the top of the next lower frame. Vertical assemblies of end frames are secured to each other at 7 or 10-foot distances with tubular steel cross braces. Guardrails and guardrail posts are available for the working level. Cross braces and guardrails are attached by means of wing nuts on studs. Working platforms can be located at 16-inch intervals to follow the progress of the work. Work materials may be placed at waist level on a convenient material rack. End frames are designed with a built-in ladder for easy access to work platforms.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 4.

Million-Pound Loads Applied to Concrete

A 1,000,000-pound Baldwin Locomotive Works concrete-testing machine was a center of attraction at dedication ceremonies of the new Portland Cement Association laboratories (see C. & E. M., August, 1950, pg. 55). The specially designed machine can apply loads up to 1,000,000 pounds in compression or flexure to structures as large as 30 feet long, 10 feet wide, and 15 feet high. These loads, applied hydraulically, are measured by a separate hydraulic system which has an accuracy within 0.1 per cent.

Loading speed can be varied from 0 to 2½ inches per minute, return speed from 0 to 19½ inches. The hydraulic load-measuring system consists of an Emery cell, carried on the machine's crosshead in such a way as to be compressed between it and the platen, and a Tate-Emery indicator in the control cabinet. A pacing disk in the indicator dial can be set to any desired rate of load application from 500 to 1,000,000 pounds a minute.

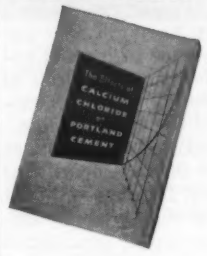
The machine has welded construction in bed plate, columns, and upper horizontal frame member. Maximum clear space between columns is 10 feet and between bed plate and crosshead platen 16 feet. The machine stands almost 22 feet high to the top of its frame, and extends more than 12 feet below the floor. It rests on a concrete foundation supported by 27 concrete piles averaging 35 feet in length. A safety color scheme is used: high-visibility yellow for crosshead and 15-ton overhead crane; light bluish green for frame and control cabinet.

Dr. A. Allen Bates, PCA Vice President for Research and Development, and his associates plan to test load capacities of concrete wall and floor panels, road slabs, reinforced and prestressed beams, concrete-block assemblies, and other large monolithic or assembled concrete structures. They will also investigate local stresses and strains in concrete members under load by means of SR-4 resistance wire strain gages bonded to the concrete surfaces and imbedded in concrete.

Caterpillar Ups Hunkele

Caterpillar Tractor Co. has a new Assistant Manager in its Sales Engineering Division. He is H. J. Hunkele, Jr., formerly a special representative in the Sales Development Division.

HERE ARE THE FACTS
about the use of
Calcium Chloride in Concrete



"The Effects of Calcium Chloride on Portland Cement" is a 40-page semi-technical book that tells you the facts about the use of Calcium Chloride in concrete. It describes in detail the carefully controlled tests that have been conducted by recognized authorities in the field and in the laboratory . . . and the results obtained.

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Everybody who works with concrete—directly or indirectly—will be interested in this book. It gives factual answers to such questions as . . .

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These are just a few of the questions answered in "The Effects of Calcium Chloride on Portland Cement." In addition, there are graphs, tables, charts and much material that is now available for the first time in this book.

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"The Effects of Calcium Chloride on Portland Cement" is being made available without any cost or obligation by the Solvay organization. For your free copy, simply write on your business letterhead to Dept. 54-9, Solvay Sales Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N.Y. Editions are limited, so rush your request now.

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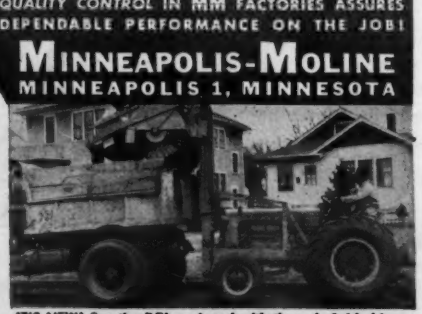

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Distributor Doings

Osborne Marks Its Tenth Year

This year marks the tenth anniversary of Osborne Equipment Co. of Knoxville and Chattanooga, Tenn. In those ten years the company has risen to a place of high standing among southern machinery-supply firms, thanks to its good staffing and expert servicing. Primary emphasis has been laid on heavy-duty units such as the various Marion machines which the firm now handles.

Osborne's modern heaquarters building in Knoxville, located along the Tennessee River, is 370 x 150 feet and houses a large general office and six smaller offices. Operations at Chattanooga are carried on in a building that measures 100 x 150 and contains three offices. The company's service setup includes a well equipped pump-repair room for servicing fuel pumps and diesel engines, and a well arranged department for its $100,000 inventory of parts.

President and founder Tom Osborne has been active in the construction business for 30 years. Other key personnel at Knoxville include O. A. Nystrom, Treasurer; Bob Osborne, Vice President and Sales; George Hitch, Sales; Bill Lawhon, Service; and W. C. "Deacon" Jones, Parts Manager. Charles Riggle manages the Chattanooga branch which Bob Osborne opened in 1945. Lawrence G. Foster is the District Manager for Osborne in the important industrial territory of upper east Tennessee. Altogether, 25 employees serve this up-and-coming distributor firm now heading into its second decade.

Chadwick Comes to Dalrymple

J. E. Chadwick has joined Dalrymple Equipment Co., Amory, Miss., as Sales Manager. He was formerly Assistant Sales Manager of the Koehring Co., and before that spent 16 years with the Missouri State Highway Department in the construction and maintenance departments.

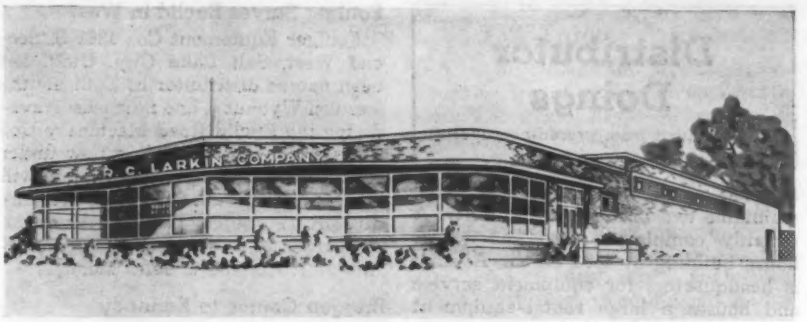
Dalrymple's accounts include Allis-Chalmers, complete line; Blaw-Knox forms and bins; General Motors trucks; Gorman-Rupp centrifugal pumps; Ingersoll-Rand compressors and equipment; Koehring draglines, shovels, cranes, etc.; Leschen and J. & L. wire rope; Parsons excavating equipment; Gar Wood scrapers, bulldozers, dump bodies, etc.; and blades for all makes of graders and scrapers.

Hydro-Line Appoints Kepler

Kepler Engineering Co., of Akron, Dayton, and Cleveland, Ohio, is the exclusive representative in Ohio and northern Kentucky for the air and hydraulic cylinders made by Hydro-Line Mfg. Co. of Rockford, Ill.

Larkin Builds Rockford Branch

Before the snow flies this year, R. C. Larkin Co., Chicago distributor, will have a new branch house on Samuelson Road and U. S. Route 51 Freeway, a mile south of Rockford, Ill. The new



The new Larkin branch just outside of Rockford will offer faster service to contractors in northwestern Illinois.

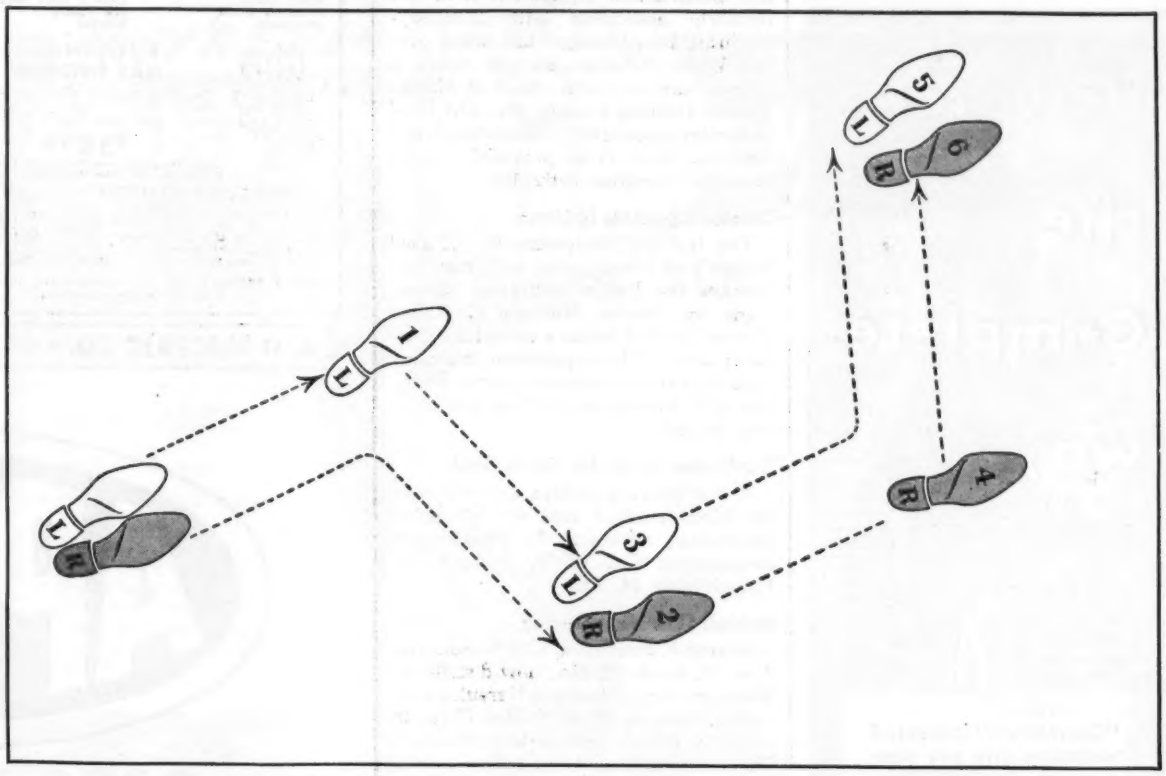
80 x 152-foot building is on a 10-acre site and will contain showroom, parts department, office, shop, and warehouse. Sjostrom & Sons is building the place and Anderson Brothers graded the site; both of these companies are Rockford contractors.

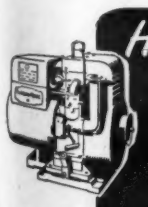
Larkin handles International tractors and power units, Hough Payloaders and tractor shovels, Buffalo-Springfield rollers, Lorain cranes and shovels, Adams motor graders, Baker snow plows, Cleveland trenchers, Jahn machinery trailers, and other items of allied equipment.

Twenty-Seven Years for Gartner

The F. W. Gartner Co., Houston, Texas, celebrates its 27th anniversary this year. Founded in 1923 by F. W. Gartner and his brother George, the

(*Continued on next page*)





Here's your off-highline Power Supply!

FAIRBANKS-MORSE
GENERATING SETS

Need power to make a success of a roadside restaurant, athletic field, parking lot, used car lot, motel, drive-in theater or any other enterprise in locations beyond the reach of highline service?

See your local Fairbanks-Morse dealer about installing a dependable generating set! He can supply generators in capacities from 600 to 35,000 watts—A.C., D.C., or A.C.-D.C. If you don't know the name of your nearest Fairbanks-Morse dealer, write today to Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE
a name worth remembering

Diesel Locomotives and Engines • Electrical Machinery • Pumps • Scales • Home Water Service and Heating Equipment • Rail Cars • Farm Machinery

It only takes a few minutes to learn the right steps!

DANCING IS EASY—once you learn what steps to take.

The same holds true for saving money for the future.

It will take approximately two minutes to find out how you can invest in either one of the two *automatic* plans offered by U. S. Savings Bonds.

Inquire at your place of business about the Payroll Savings Plan. Learn how easy, convenient, and *painless* it is to put aside savings for Bonds right from your paycheck.

Or, if you have a checking account, ask at your bank. They'll explain all about the Bond-A-Month Plan, in which you use your checking account as a means for investing in U. S. Savings Bonds.

Both plans are simple, and call for no effort on your part. Both plans add up to the same thing—money to live on in the future.

So start finding out about them. Remember, it only takes two minutes today to learn how you can make your tomorrows a lot more carefree!

Automatic saving is sure saving—U.S. Savings Bonds

Contributed by this magazine in co-operation with the Magazine Publishers of America as a public service.

Distributor Doings

(*Continued from preceding page*)

firm has grown with Houston and now maintains two branches in that city. A recently completed office and warehouse building at 3805 Lamar Avenue is headquarters for equipment service and houses a large rental-equipment department. The firm does sand-blasting, metalizing, steam-cleaning, and building-cleaning, and handles concrete-wrecking equipment.

More Magnetic-Tool Dealers Wanted

T. B. Miner Tool Co., which makes magnetic stub-nail holders and other magnetic tools, has some dealer territories open, notably in Texas, Philadelphia, and Boston. Write to the company at 16254 Hesperian Blvd., San Lorenzo, Calif.

Foulger Serves Euclid in West

Foulger Equipment Co., 1361 S. Second West, Salt Lake City, Utah, has been named distributor in Utah, southwestern Wyoming, and northeast Navada for the Euclid Road Machinery Co., Cleveland. A new building now under construction at the present location will be ready for occupancy in the near future. B. L. Foulger is President of the company. O. M. Foulger is Treasurer. And J. T. Holland is Sales Manager.

Briggen Comes to Kennedy

Arthur E. Briggen was recently elected Treasurer and General Manager of D. D. Kennedy, Inc., Chicago dealer. He was formerly Assistant Secretary and Treasurer of the Foote Co., Inc., Nunda, N. Y.

D. D. Kennedy, Inc., is a distributor for Foote, Blaw-Knox, Allis-Chalmers, General Motors, Bucyrus-Erie, Bethlehem Steel, Iowa Mfg., and other manufacturers of road-building and earth-moving equipment.

Dealer Now Deals in Pleasure

Paul B. Cochran, well known in the construction equipment field and formerly associated with Kennedy-Cochran, Inc., Chicago, has taken over the White Sulphur Springs Hotel, a year-around vacation resort at Mann's Choice, Bedford County, Pa. The hotel has been completely redecorated and facilities have been provided for all important vacation activities.

Diester Appoints Indiana

The Indiana Equipment Co. of Fort Wayne and Indianapolis, Ind., now distributes the line of vibrating screens made by Diester Machine Co., Fort Wayne, in all of Indiana except the Calumet area. The equipment company maintains showrooms and service facilities with factory-trained mechanics at each branch.

Territories Open for Meco Seal

A few distributorships are still open for Meco surface seal for black-top pavements, according to Maintenance Engineering Co., 16 W. Johnson St., Philadelphia 44, Pa.

Riddell Has New Dealer

George F. Smith Co., 5215 Manchester Ave., St. Louis 10, Mo., now distributes Warco motor graders and Hercules road rollers, made by W. A. Riddell Corp., in southern Illinois and eastern Missouri. The company has been active in the construction-equipment field since 1912.

Parker-Danner Expands

The Parker-Danner Co., Hyde Park, Mass., has purchased a building at 71 Needham St., New Highlands, Mass. The building has 7,500 square feet of floor space and about 28,000 square feet of land which can be used for outside storage. The company says that the plant was established as an extra service to the construction industry of metropolitan Boston.

Waite Has Hyster Account

J. P. Waite, Inc., 3304 W. Pierce St., Milwaukee 4, Wis., now covers 46 counties in eastern Wisconsin and 15 counties in northern Michigan for the Hyster Co., Portland, Oreg. In addition to selling and servicing Hyster lift trucks, straddle trucks, turret trucks, mobile cranes, and auxiliary attachments, Waite handles equipment for Warner & Swasey Co. and Federal Machine & Welder Co.

Several New Dealers for Huber

Huber Mfg. Co., Marion, Ohio, has three new Texas dealers who will handle its complete line of road-building and maintenance equipment. Overton & Ross has the Huber account in the Dallas area, Overton & Mims in the

(*Concluded on next page*)

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THE COMPLETE WELLPOINT IS SELF JETTING
"Complete's" patented wellpoints give you compactness, simplicity, lightness and Strength. Keep wet work bone dry when other methods fail. Write or wire for estimates, and engineering consultation.
Don't Gamble with costly water hazards . . . get "COMPLETE" and get results!
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COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11th STREET
LONG ISLAND CITY, N. Y.
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GARY, INDIANA
COMPLETE
WELLPOINT
SYSTEMS
FOR SALE OR RENT

BUY NOW and SAVE
BRAND NEW! WAR SURPLUS
LIGHT PLANTS

It's Unbelievable
50 to 75% SAVINGS
Use for: Farms, cottages, stores, garages, floodlighting, drilling rigs, refineries, house trailers, fire departments, sound trucks, yachts, tugs, construction, airports, police radios, etc.

Below are TWO of the most SENSATIONAL light plant buys in the country:

2500 WATT, AC, 115 Volt, 60 Cycle, Single Phase. ENGINE Briggs & Stratton, air cooled, 6½ HP. GENERATOR: Westinghouse or Leland, belt drive with guard and Duplex receptacle mounted. NET WEIGHT 310. Gross shipping weight 441. Shipping size 36"x19"x26". Complete with $30.00 worth of spare parts and rubber cable valued at over $100.00, tools, instructions and fully GUARANTEED. WAS FORMERLY PRICED AT APPROX. $700.00.
NOW PRICED FOR YOU AT ONLY ..... $295.00 NEW
Reconditioned $225.00
Generator only, NEW $145.00

5 KW, 120 Volts, 60 Cycle, AC, ENGINE: Hercules 4 cycle, Gasoline. GENERATOR: Mfr'd by Kohler Bros. Unit includes remote control cable on reels valued at $300. 150' of 2 wire No. 6 and 150' of 3 wire No. 18, exhaust pipe, power cable plug, remote control stop start switch, automatic volt regulator. Continuous duty 6.3 KVA at 80% power factor, frequency meter, radio and television filtered. Unit is completely automatic and cannot be damaged by lack of care. Net weight 770 lbs. Shipping weight 1070 lbs. 44" long, 22¼" wide, 30" high, 230 volt output can be supplied on all units at a small additional cost. FORMERLY PRICED AT $1600.00. NOW PRICED FOR YOU AT ONLY ..... $495.00 Guaranteed

750 to 1000 Watt, All Single Phase, 110 Volt, AC, NEW $179.50

VOLTS	WATTS	PRICE
110-220	300	$ 89.50
110	7500	$75.00
110-220	10000	$95.00
110-220	25000	$195.00
110-220	35000	$795.00
110-220	60000	$995.00

All units of 10,000 Watts or over are 110-220 Volts and single or 3 phase.

WAR SURPLUS
Below are just a few of the many items we have in stock at sensationally low prices:
Builders trailer; Dual wheels, 8 ply tires 9:27. Price $265.

Pumps
Air Compressors
Air Tanks
Spray Outfits
Extension Cords
Generators
Fire Pumps
Gear head motors
Electric hand saws
Electric chain saws
Saw Tables
Winches

A TERRIFIC BUY!
GAS ENGINES
Briggs & Stratton NEW in original crates. Model AP 1¾ to 2½ HP. ¾" shaft. List Price $102. Your price $59.50
Used Briggs-Stratton Model ZZP 5 to 7 HP List $141. GUARANTEED. ONLY $60.50.

"MERCURY CLUTCH"
For motor-scooters, motorbikes, lawn mowers, etc. Can be used with electric motor or any gas engine. "A" belt pulley. List price $28.00. YOUR price ⅝" bore $7.95. ¾" bore $8.95.

WRITE TODAY for our free catalog listing thousands of MONEY SAVING bargains.

C & H ELECTRIC CO. • 426 W. JUNEAU ST. • MILWAUKEE 3, WIS.

APSCO
GETS RESULTS

WIDEN ROADS WITHOUT FORMS
Apsco Wideners handle both hot mix and concrete up to 6' widths and shoulder building with dirt or gravel up to 10' widths. *Investigate!*
Wideners—Base Pavers—Trench Rollers
ALL PURPOSE SPREADER CO. Elyria, Ohio U.S.A.

¾ TON WINCH
$30 LESS ROPE
This Hand Winch is ideal for moving and installing heavy machinery, loading trucks, hand derricks, cranes, gin poles, loading logs, sawed lumber, loading implements on trailers, hoisting silage, pulling wells, etc. Can be bolted anywhere and operated in any position. Made of electric steel; bronze bushed; 2 speeds, 8.10 to 1 for heavy loads . . . 2 to 1 for fast operation . . . self locking to hold loads at any position.
Overall Dimensions 12½ in. x 7⅝ in. x 7 in. Handle 10 in. long. Drum size 3 in. dia. x 6 in. long x 6 in. dia. flanges. Will hold 100 ft. ⅜ in. Wire Rope. Illustrated with 50 ft. ¼ in. Wire Rope. Shipping Wt. 37½ lbs. GUARANTEE—Five-day return privilege.
$39.50 WITH 50 FT. of ¼ in. WIRE ROPE
Send remittance with order and we prepay postage. If your distributor doesn't have it for literature and information write:
GOLD FOUNDRY & MACHINE WORKS
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Distributor Doings

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Wichita Falls area, and Contractors Machinery Co. in San Antonio.

Pershing Equipment Co., Inc., has been named Huber distributor in southwestern Indiana and several Kentucky counties. Head offices of the firm are at 1710 N. Fares Ave., Evansville, Ind.

Retirement That Didn't Last

Once an equipment distributor, never a retired play boy. At least that's Dick Evans' experience. In 1945 he closed his business in Chicago in order to retire. But he is now going back into business at 4554 Broadway, Chicago, Ill. He will handle only used and rebuilt equipment. It's good to get back in harness, he says.

Onan Distributor in Canada

The Keyes Supply Co., Ltd., Ottawa, Ontario, Canada, is now an exclusive distributor for D. W. Onan & Sons, Inc., in Ontario and western Quebec. Keyes formerly handled the Onan Portaweld welder, but it now handles the entire Onan line including electric generating plants, engines, and separate generators. Complete service and repair facilities are available for all equipment. Branch offices of the distributor company are located in the towns of North Bay, Kingston, Belleville, Cornwall, Sudbury, Pembroke, Kirkland Lake, and Hawkesbury.

Mills Represents American Well

Mills Engineering Co., Inc., 10 High Street, Boston, Mass., now represents the American Well Works, Aurora, Ill., in the states of Maine, New Hampshire, Massachusetts, Vermont, and Rhode Island. It handles the pumping, water-purifying, sewage, and industrial waste-treating equipment manufactured by American Well.

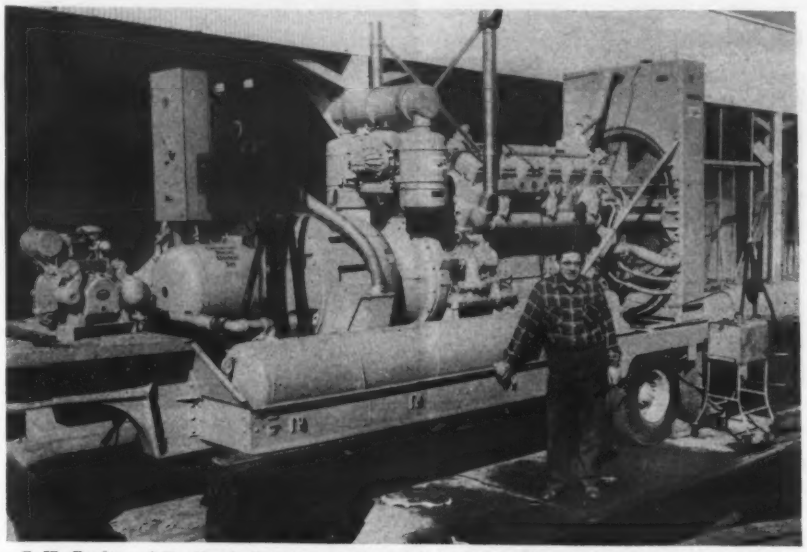
B-E Dealer in South Carolina

Bell-Lott Road Machinery Co., 430 Meeting St., West Columbia, S. C., is now a distributor for the general-purpose excavators made by Bucyrus-Erie Co., South Milwaukee, Wis. All sales made by the new distributor will be backed by a post-sale service policy.

Eriez Distributor

The Ponsford-Moos Equipment Co., 516 San Francisco St., El Paso, Texas, is the exclusive sales representative in Panama, Costa Rica, Nicaragua, El Salvador, Honduras, and British Honduras for the Eriez Mfg. Co., Erie, Pa. The firm, which has been serving Eriez in northern states of the Republic of Mexico since the beginning of the year, handles all types of Eriez magnetic separators and maintains an engineering service for purchasers of Eriez equipment.

AGAIN AVAILABLE
Fennel
Surveying Instruments
Complete line of high quality, economically - priced, transits and levels of revolutionary design. Lightweight, totally enclosed, climate-proof, ideal for every type of construction work.
Literature and prices available on request.
NORBERT DIENSTFREY
478 WATER STREET NEW YORK 2, N. Y.



J. N. Conley of Portland, Oregon, purchased this Caterpillar 12-cylinder V-type diesel engine mounted on a La Crosse trailer from Interstate Tractor & Equipment Co., to power his crushing plants. This is the third such portable 314-kw electric set Interstate has delivered this year.

New Broadside Features Ten Tractor Attachments

A new broadside presenting the Profit System of companion tools for the Case VAI tractor has been prepared by Construction Products Corp., 410 San Fernando Road, Los Angeles 31, Calif. These ten tractor attachments are the Profit scoop, angle grader, earth auger, trencher, rear lift hook, air compressor, rear-mounted winch, disk harrow, front-end loader, and angle-blade dozer. Each piece of equipment is illustrated and fully described.

The literature points out that the use of these attachments in combination, one in front and one in the rear, increases job productivity. Citing trenching operations as an example, the company points out that the front-mounted dozer blade may be used for backfilling after the trencher has cut the trench and the pipe has been placed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 24.

THEY'RE NEW!
LORAIN 50 SERIES Moto-Cranes
NEW is the word for the new Lorain-50 Series Moto-Cranes! *New* machines . . . with *newly* designed Booms . . . *new* Turntables . . . and *new* Carriers. They're not "jazzed up" lighter machines, stretched to produce "paper" capacities. They're the biggest, strongest, safest 25-ton rubber-tire cranes you can buy! They're exactly what you would expect the leader in rubber-tire crane-shovels to produce! They're here—now—today! Where can you see them? Your nearby Thew-Lorain Distributor will make arrangements and give you full facts. Get in touch with him soon!
New CRANE BOOM . . .
✓ Wide, deeper, stronger.
✓ Quick-action pin connections.
✓ Usable in 100 ft. lengths, 130 ft. with extensions.
✓ 6 part hoist line reeving with 3 sheave boom head.
✓ Eight-part boom derricking.
✓ Convertible to clam, drag, shovel, hoe.
25-TON CAPACITY
2 Models
MC-504 (102" wide)
MC-504W (120" wide)
New TURNTABLE
✓ Hydraulic Coupling gives the smoothest operation—removes the jerks and slam-bang from crane operation.
✓ New, wider, shoe style swing clutches with floating anchors.
✓ Turntable rollers on anti-friction bearings.
✓ Self-aligning Center Pin design.
New CARRIER
✓ Specially designed for shovel-crane impacts and stresses.
✓ Box section side members 10% deeper than used by others.
✓ 220 H.P. Gas Engine.
✓ 10 forward speeds (30 M.P.H.); 2 reverse speeds.
✓ Man-saving air assist steering.
THE THEW SHOVEL CO. LORAIN, OHIO
THE THEW LORAIN 50 SERIES
It isn't a MOTO-CRANE unless it's built by Thew-Lorain

New Propane Engines For Construction Use

You can power your trucks, road machinery, generators, drill rigs, rock crushers, hoists, pumps, and other construction machinery at lower costs with propane-fuel engines, according to Fageol Products Co., of Kent, Ohio. The company has recently produced a line of propane-fuel engines with a power range of 162 to 250 bhp.

The 10 to 1 compression ratio of these new engines—15 to 1 is also available—is made possible by a patented combustion chamber which permits the use of higher compression ratios without increased bearing loads; high compression ratios permit full utilization of propane's 125-octane rating. The controlled turbulence within the chamber is also said to provide efficient scouring action. This prevents accumulation of carbon deposits.

Other features? Construction is of the unit type in which overhead valves are operated by an overhead crankshaft. Aluminum-alloy full-skirt pistons have 3 compression rings and 1 oil-control ring. Connecting rods are matched for smooth operation. The Fageol engines are available for horizontal or vertical mounting, right or left-hand installation, clockwise or counter-clockwise rotation.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 113.

Portable Conveyor

A portable conveyor specifically designed for the small gravel and sand-handling operator is offered by Triangle Engineering Co., 2948 W. 26th St., Chicago 23, Ill. It features sturdy construction, low overall height, swivel wheels, hinged loading hopper, and sealed idler bearings. Its Hydra Lift permits raising or lowering of the discharge terminal with one hand.

The Master Stacker is available with boom lengths of 15 to 30 feet, in 5-foot increments. Standard 4-ply rubber-covered belts of 14 and 18-inch widths are available. The unit may be powered by a gasoline engine or an electric motor, with tail drive standard and head mounting optional. Belt frames are of the lattice-boom type, electrically welded. The conveyor is balanced on rubber-tired or steel wheels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 59.

Self-Feeding Loader

The self-propelled self-feeding belt-type TraveLoader made by J. D. Adams Mfg. Co., Indianapolis 6, Ind., is said to have a pickup and loading capacity of 5 cubic yards per minute, working with windrowed material such as dirt, sod, gravel, sand, bituminous mix, scarified black-top, snow, etc.

The TraveLoader has forward speeds ranging from 0.5 to 26 mph. The revolving feeder places a continuous flow of material on the conveyor belt. This is then passed underneath the cab, up the belt, and into following trucks. The operation, the company points out, in no way interferes with highway traffic.

The full-floating feeder automatically adjusts itself to the size of the windrow. Width of gather ranges from 3 feet 3 inches to 8 feet 3 inches. Hydraulic controls raise or lower the entire front end of the machine, the feeder, and the rear section of the conveyor. Adjustable shoes set the feeder pan to obtain a clean pickup. The rear section of the conveyor is hinged to provide a wide range of discharge heights; this is said to permit better distribution of the load on the truck without spillage, and to hold down dust material that is dry.

The TraveLoader is powered by an International IU-6A tractor-type gasoline engine which features replaceable cylinder sleeves, valves in head, heavy flywheel, updraft carburetion, gear-driven governor, and large-capacity cooling system. Standard equipment includes a cab frame, upholstered seat, fenders, electric starting system, push side doors, and air precleaner for the engine.

A TraveLoader picks up surplus material along a highway that has been widened approximately 2 feet with concrete.

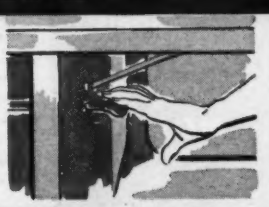
Further information on this loader may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 60.

MSA Safety Man Dies

Harry F. Idzkowsky, Safety Director of Mine Safety Appliances Co., died in Pittsburgh on July 14. During his service, the firm received many national awards for its safety record, among them the National Safety Council's in the 1948-49 competition.

The New INTERNATIONAL TD-24

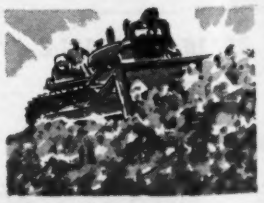
HERE'S WHAT THE



Positive all-weather starting on gasoline, with quick change-over to full diesel operation, all from the seat.

Separate reverse lever for quick change of direction. The tractor moves in the direction the lever is moved.

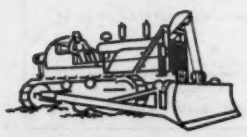
Self load and run with scrapers of 17-yard capacity—and shift gears on-the-go with the rolling load.



Cut waste shifting time out of work cycles; provide the best speed for every operation, 8 speeds in each direction!

INTERNATIONAL HARVESTER

INTERNATIONAL



A New Power Grader

The new No. 501 engine-over-axle power grader developed by the Meili-Blumberg Corp., of New Holstein, Wis., features large low-pressure tires, frame weight of 130 pounds per foot, and extra-heavy axles with 19½-foot clearance. The housing of the rear axle is of one-piece cast steel.

Other features of the M-B 501 include a cab with an inside clearance of 6 feet 6 inches, undercoating on the cab, and a 10-gallon hydraulic oil tank. Designed for tough grading jobs—1 to 1 sloping, cutting and cleaning ditches, building, widening, shaping, and maintaining roads—the 501 is powered by a 50-hp gasoline or diesel engine mounted over the axle. There are a variety of attachments available, including a hydraulic scarifier with replaceable alloy-steel plow teeth.

Extra-large low-pressure tires feature the new Meili-Blumberg No. 501 power grader.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 77.

CHAMPION of Crawlers

"The TD-24's work right along on slopes so steep we have to cut them down before other tractors can climb them even without loads," says Bob Rardin of Rardin Brothers, Akron, Ohio. "They are fast tractors, easy to shift and have plenty of power. This combination really moves dirt." His TD-24 was equipped with a bulldozer.

"It will out-buck any tractor I've ever run," says Harold Wooley's operator, Drain, Oregon, "and sure push dirt up hill—and climb steep grades." His TD-24 works regularly on 30% to 50% grades, building mountain roads.

"I wouldn't have anything else," says another Oregon operator. He works for V. R. Russell & Sons of Valsetz. "It's sure fine on bulldozing; best dirt mover I ever got hold of."

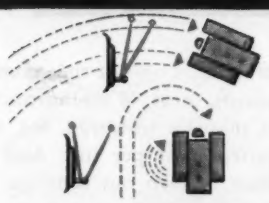
That's the way owners and operators talk about the International TD-24 Crawler. It has earned their praise, for it does everything any other big tractor can do, *plus many things that NO other tractor can do*. The TD-24's versatility makes it the most useful and profitable earth-mover in any equipment line-up.

Visit your International Industrial Power Distributor for a demonstration. Then ask yourself how long you can get along without this big red worker and the extra earnings it will produce.

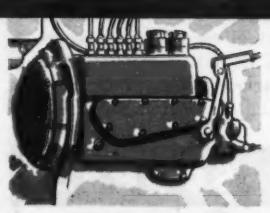
INTERNATIONAL HARVESTER COMPANY
Chicago

TD-24 CAN DO FOR YOU

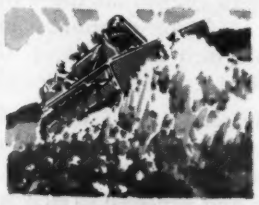
Instant speed change up or down one speed, or stop, without declutching. Planet Power drive does it!



Planet Power steering puts turns with power on both tracks, feathered turns and pivot turns at your fingertips.



Torque Control feature of fuel injection pump increases engine torque when needed to overcome overloads.



Work on grades up to 100%. Its power, ground contact, balance and lubrication are right for licking any grade.

Handle heaviest loads on gradual turns as easily as straightaway because both tracks are powered in the turn!

Push or pull through tough going. The engine delivers extra "power" when its r.p.m. is pulled down by load.

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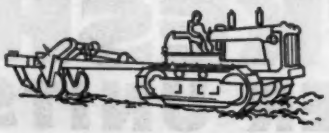

Exam for USBR Engineers In the West or Midwest

The U. S. Civil Service Commission has announced an examination for Engineer to fill positions paying $4,600 and $5,400 a year in the Bureau of Reclamation. The positions are located in the west and mid-west.

Applicants for these positions will not be required to take a written test. To qualify, they must have completed a 4-year college course in engineering or have had 4 years of technical engineering experience. They must also have had professional engineering experience which includes specialization in one of the branches of engineering. Appropriate graduate study can be substituted for experience required for the $4,600 jobs and for part of the experience required for the $5,400 jobs. The maximum age limit of 62 years will be waived for persons who are entitled to veteran preference.

Further information and application forms may be obtained from most first and second-class post offices, civil-service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted until further notice and must be filed with the Executive Secretary, Central Board of U. S. Civil Service Examiners, Bureau of Reclamation, Denver Federal Center, Denver, Colo.

New DC-Motor Bulletin

Users of dc motors from ¾ to 1,000 hp are offered a new illustrated 12-page bulletin by the Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland 10, Ohio. Design, construction, frame dimensions, selection, and ordering data for Type T heavy-duty constant and adjustable-speed motors are featured in the booklet.

Available in dripproof, splashproof, totally enclosed, explosionproof, blower-ventilated and gear-motor construction, these motors are designed to meet rugged service conditions. The catalog gives special attention to the mechanical features and electrical characteristics which enable these motors to meet exacting drive requirements.

This literature may be obtained from the company by requesting Bulletin C-2001, or by using the Request Card at page 16. Circle No. 10.

Mechanical Equipment

The new 34-page Catalog 550 issued by McNally Pittsburg Mfg. Corp., Pittsburg, Kans., and Wellston, Ohio, itemizes babbitted journal boxes, roller-bearing pillow blocks, centrifugal slurry pumps, water valves, conveyor takeups, roller hold-backs, steel chain of all types, elevators, conveyor systems, and perforated steel screen plates. It also includes specifications on conveyor and drive pulleys, V-belt sheaves, gears, sprockets, shafts, and keys.

All equipment listed is for heavy-duty service. Complete descriptions are supplemented with photographs, dimension drawings, data tables, and specifications. Where dimensions are to be given by the purchaser, the data needed are listed explicitly.

This literature may be obtained by requesting Catalog 550 from the company, or by using the Request Card at page 16. Circle No. 147.

Allegheny Promotes Presley

Royden C. Presley has been promoted from Manager of the Toledo, Ohio, District Sales Office of Allegheny Ludlum Steel Corp. to District Sales Manager of the Birmingham, Ala., area.

Movable Trunk Speeds Digester-Tank Pours

Contractor Saves Money by Discarding Fixed Tremies in Favor of Movable Trunk on Sewage Plant Project

By RAYMOND P. DAY,
Western Editor

✦ BILL NAUMANN, General Superintendent for M. M. Sundt Construction Co., was trying this thing for the first time in his experience. He had no particular reason to be nervous. The scheme should work and save money. It might have been Naumann's thorough coverage of the pour that made him seem jittery.

Leon Jackson, Resident Engineer for the firm of Headman, Ferguson & Carollo, consulting engineers of Phoenix who designed the project, was also on hand. As the crew moved around the digester tank with the first lift, he followed. It was inevitable that he should bump into Naumann.

"Well, what do you think?" Naumann asked.

"You've got something," Jackson admitted. "I believe it's going to work better than anything we've tried in a long time."

What the two men were watching was a concrete-handling trick which saved money and time. By discarding fixed tremie stations and using only one movable elephant trunk for each concrete crew, Naumann was starting in at top speed on the job's most difficult pour.

When Sundt has finished the pouring this fall, the city of Tucson and its metropolitan area will have a sewage plant to match their growth. The $1,000,000 project will have a capacity of 12 mgd, or accommodation for 120,000 people.

Structures Create a Problem

The project is designed to produce concrete of high density, watertight consistency, and smooth face. The concrete was placed to close tolerance. Compared even to current sewage-plant practice, the work is strictly high-class. Stacked against ordinary concrete masonry, the job was extremely painstaking.

Two digesters, for example, are 80 feet in diameter. Their walls vary from 15 to 21 inches and are 32 feet high. A tolerance of only ½ inch was the limit. The basic problem was how to form and hold 18 and 14-foot pours so they would remain in place.

How the problem was solved is a story of concrete forming and placing methods.

Patented Form Panels Used

Rectangular and circular structures were shaped by Uniform panels. Approximately 14,000 square feet, on a rental-purchase basis, were available for the 50,000 square feet of forming area in the project. The usual patented shapes which tie panels together were also on hand: Uniform spreader ties, circular-wall fillers, side-member angles, steel corner angles to close 90-degree meeting points, panel-lock clamps, rigid inside steel corners, and accessory hardware. The latter included liner clamps of various sizes, erection tools, breakback tools, taper pins, and scaffold brackets.

Digester pours, although perhaps the most difficult, illustrate how the work was done.

All bracing was erected inside the tank. Pours looked exceptionally

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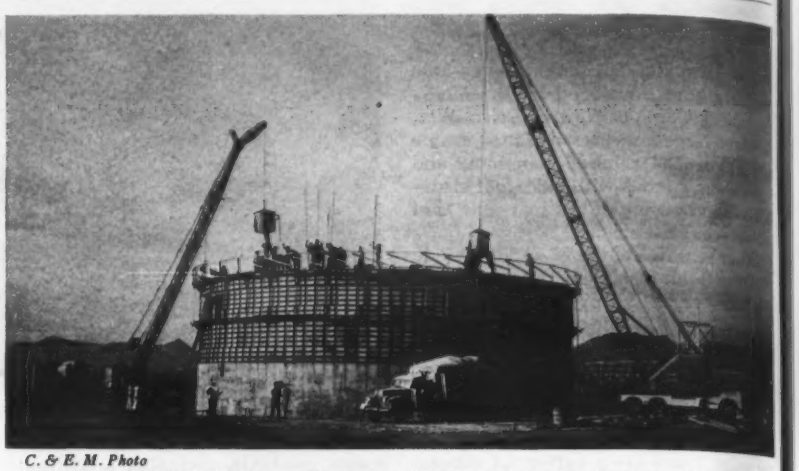

C. & E. M. Photo
The Sundt pouring trick in operation on a digester tank of the Tucson sewage plant: a Moto-Crane at left and a P&H truck crane at right handle concrete buckets from truck mixers to two concrete crews, each with its new movable elephant trunk.

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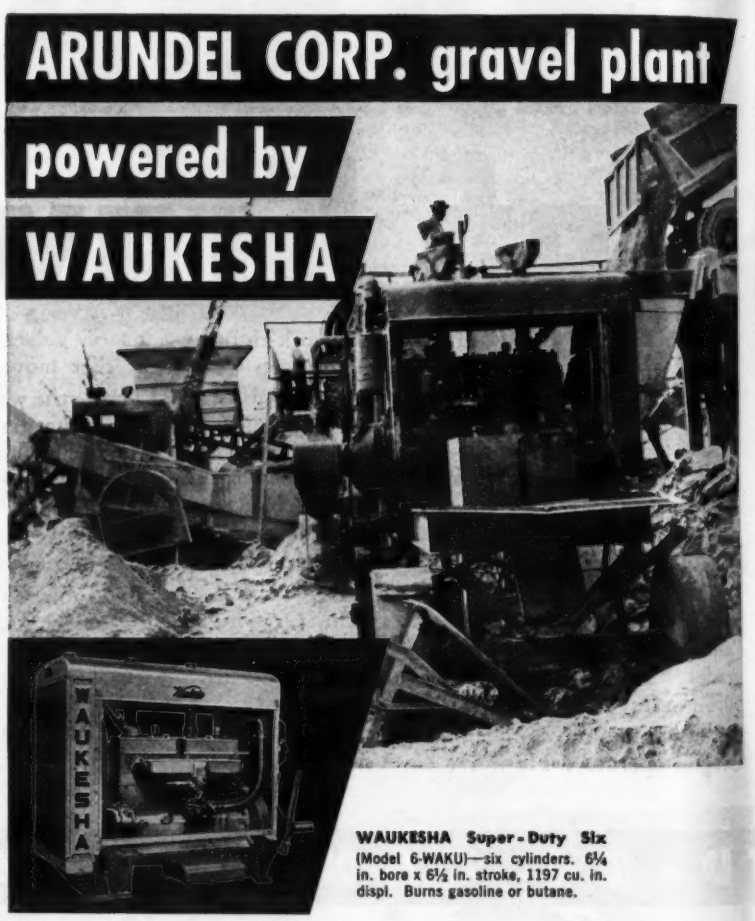

WAUKESHA Super-Duty Six (Model 6-WAKU)—six cylinders. 6¼ in. bore x 6½ in. stroke, 1197 cu. in. displ. Burns gasoline or butane.

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Waukesha Motor Company, Waukesha, Wis.
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WAUKESHA
POWER UNITS

C. & E. M. Photo
A Bucyrus-Erie Dozer-Shovel charges a Jaeger truck mixer on the $1,000,000 sewage-plant job at Tucson, Arizona.

C. & E. M. Photo
Concrete chutes from a Gar-Bro 1-yard bucket down through a canvas boot, steel sleeve, and elephant trunk to digester-tank forms. The men with the long sticks are puddlers on the job.

"clean" from the outside. Timber 4 x 4's were fastened with lag bolts to the digester floor. They were 6 feet apart at the back of the wall. Double 4 x 4 uprights were then set up from the base lagging, and nailed together with 2-inch sway bracing. The finished product was a heavy circular bracing framework just back of the panels.

The forms were set in reference to a center point. It was located at several elevations in a tower in the center of the digester. The work went along fast. On the first 18-foot pour, five carpenters set and braced 4,500 square feet of panels in 20 hours. The forms were fastened to the bracework so they could not move.

Forms were checked by measuring with a steel tape from the tower center point to the inside edge. Engineers insisted on accuracy. Concrete walls had to check within ¼ inch of true round at any point on the radius.

Since the form panels were set on a chord, the use of circular-wall fillers on this project gave a pleasing surface much closer to the finished round shape.

Double Pouring Arrangement

Pours were made by two crews. Each worked halfway around the tank's circumference.

Crew No. 1 worked with a Lorain Moto-Crane rented from Chapman-Dyer Steel Mfg. Co. This machine has 92 feet of boom, including a 12-foot jib. Crew No. 2 was served by a P&H 255-A truck crane with 80 feet of boom, rented from Tucson Warehouse & Transfer Co.

Long booms were essential. Concrete was heavy, and once the machines were spotted with their outriggers placed, they had to stay in that position and reach their half of the pour. According to Naumann's method, the cranes remained stationary. Moving was done up on top.

(Continued on next page)

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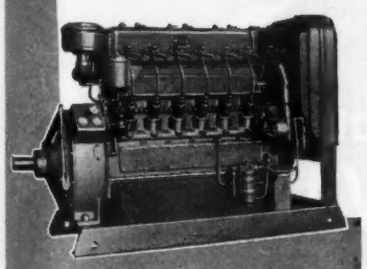

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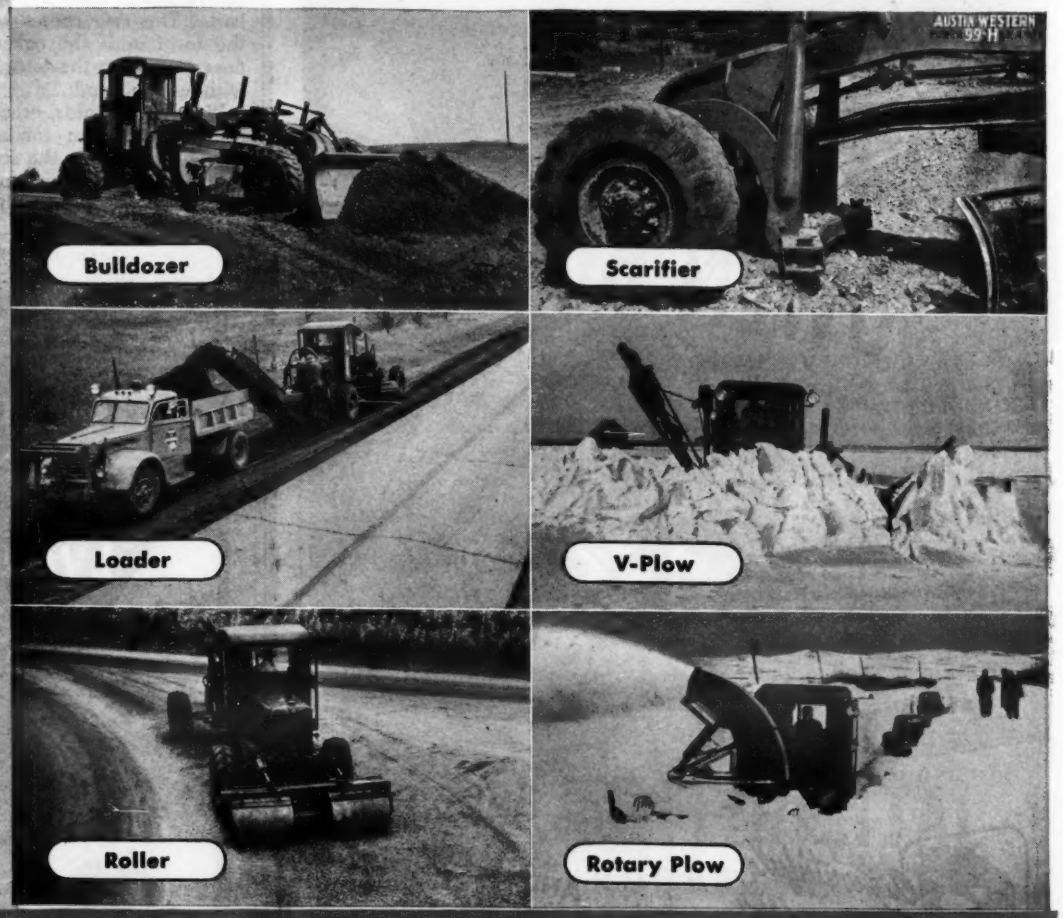

BUILDERS OF ROAD MACHINERY SINCE 1859
Austin Western

Movable Trunk Speeds Digester-Tank Pours

(*Continued from preceding page*)

Concrete was dry-batched at the commercial plant of San Xavier Sand & Rock Co., and hauled by trucks to a conveyor loading point at the sewage plant. There the material was transferred, adding water and cement, to five Jaeger truck mixers. They delivered the material to the cranes. Class A concrete was a 6-sack mix. Five and a half gallons of water were added per sack and 1 pound of Pozzolith was used per yard.

Concrete was transferred from truck mixers to 1-yard Gar-Bro buckets. Special swiveled cable connections took the twist of the load line and held the buckets stationary. The bottom doors of each bucket connected to a 3-foot canvas boot which tapered down to a steel sleeve. Special platforms were necessary to let the boot fold under without crushing while concrete was being transferred. Naumann's "trick" began where the bottom of the boot tapered off into the steel sleeve.

C. & E. M. Photo
Job Superintendent C. H. McCormick has just passed judgment on the concrete in this Jaeger truck mixer. M. M. Sundt Construction Co. is the contractor.

Small steel hooks were welded to the sleeve. They held the elephant trunk while the concrete was chuting down to the forms.

The elephant trunk was handled by two men. The foreman figured how far a bucket of concrete would fill the forms to a depth of 2 feet. The men then moved the trunk ahead that distance while the crane was picking up its bucket of concrete. For an 18-inch wall the distance was about 7 feet. It was marked in crayon or referred to the form panels if that worked more easily.

As the crane swung its bucket over the pour, the tremie men hooked the trunk to the bucket-spout hooks. The entire batch of material was dumped in that spot. As the men moved around the form, they left a 2-foot ribbon of fresh concrete which was consolidated by a Viber stinger and puddling sticks. The puddling sticks were used near the face to eliminate air bubbles. All bucket movement was carefully controlled by an experienced signalman.

As the pour advanced, some adjustment of the elephant trunk was necessary. The trunk was marked to keep its bottom within approved pouring distance regardless of the concrete level. This often spotted the bucket too high to be dumped by conventional methods, so Naumann used a pull rope on the bail. The two crews worked around the form until the concrete level was near enough to the top to drop directly without the trunk.

Wooden scaffolds, erected at pouring level, gave room for men to work. Plumb lines from the forms furnished a check on form movement due to concrete pressure. Up to the time the job was visited, the forms needed no adjustment once they were set and braced.

Naumann estimated that the use of only one tremie per crew saved a great deal of labor cost. Labor and lumber for permanent tremie platforms were saved. So was a considerable investment in tremies. His way made cleanup easier.

"The minute the last bucket is placed we just wash out the bucket and the tremie, and that's that," Naumann explained.

The same general system was used to place concrete throughout the sewage plant. Specifications called for a vertical drop in all concrete placement, so there was ample room for Naumann's system to show its advantages. It was a 7,000-cubic-yard job.

Plant Layout

The plant is of the activated-sludge type. The treated effluent will be used to irrigate adjacent farmland, and sewage sludges will be disposed of as fertilizer.

Sundt's contract calls for labor and materials in the current scheme. Units of the present system include grit and screen chambers, four coagulation and primary sedimentation tanks, two dif-

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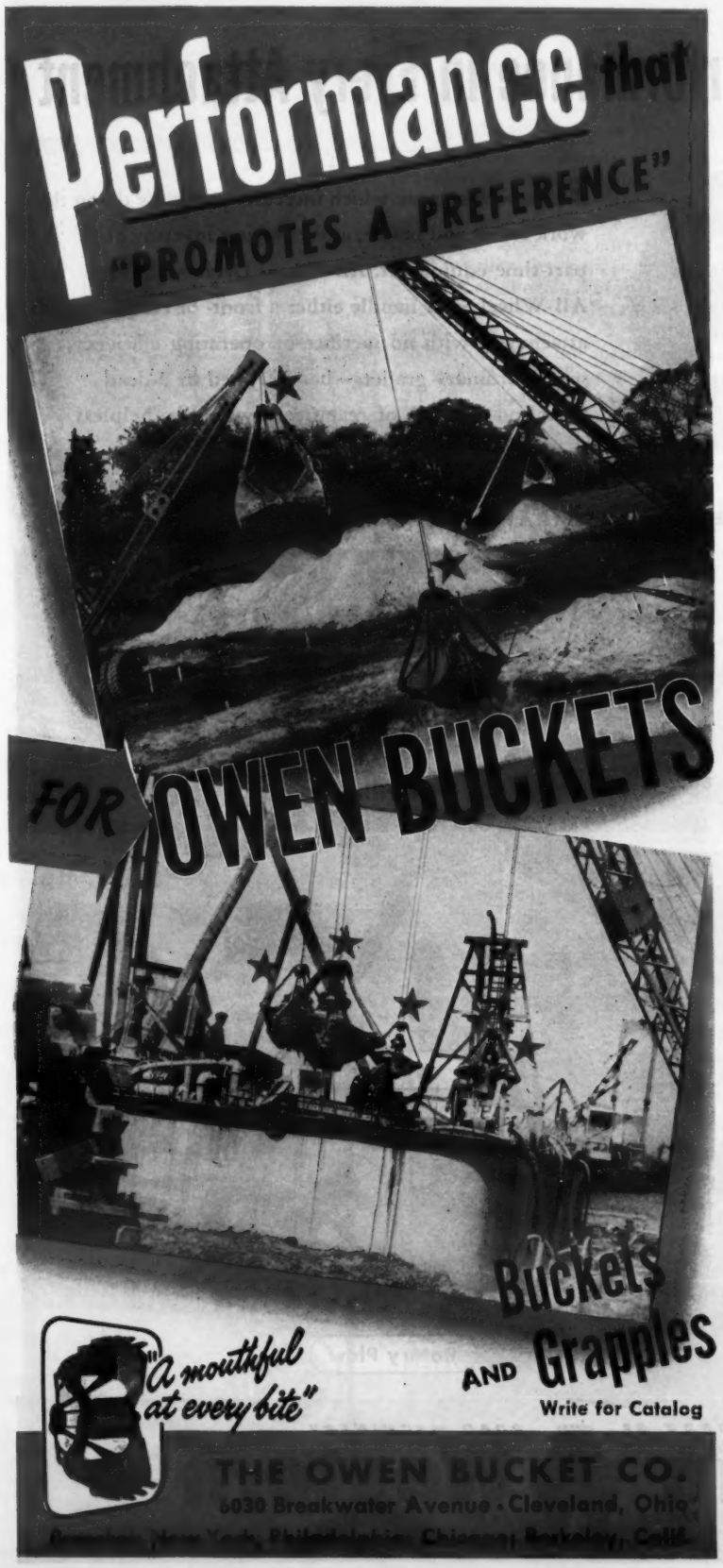

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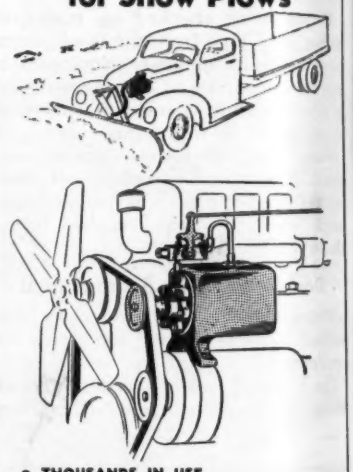

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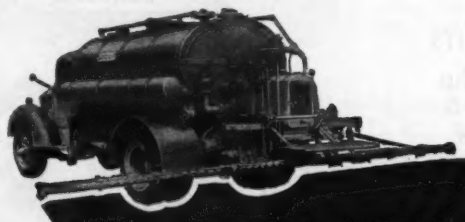

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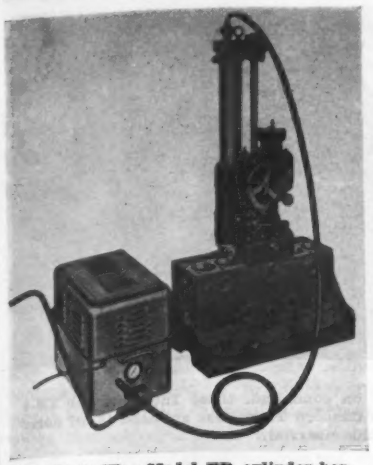

The Kwik-Way Model FR cylinder-boring machine has a capacity of 2 1/5 to 4 7/16 inches and a stroke of 12 1/2 inches.

For Cylinder Boring

A Kwik-Way Model FR cylinder-boring machine has been added to the line of motor-servicing and rebuilding equipment manufactured by Cedar Rapids Engineering Co., Cedar Rapids, Iowa. A precision machine of medium capacity for reboring pickup and light truck engines in the chassis or out, the Model FR may be used to speed engine repair in contractor and highway-department maintenance shops. Its capacity is 2 1/5 to 4 7/16 inches, and it has a stroke of 12½ inches.

The Model FR features screw feed with automatic retraction; two speeds and two feeds, instantly changeable; 3-finger centering; and quick nondistorting anchoring and clamping. Through the use of the Kwik-Way Vortex exhaustion device, chips and dust are collected at the point of the tool bit and drawn from the top of the boring spindle. All gears, bearings, and moving parts in the machine base are pressure-lubricated. Chrome plating, wherever practical, minimizes rust and corrosion of exposed metal surfaces.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 75.

Conveyor Firm Moves

Robins Conveyors Division, Hewitt-Robins Inc., has moved its Cleveland office from 215 Rockefeller Bldg. to 8905 Lake Ave.

Movable Trunk Speeds Digester-Tank Pours

(*Continued from preceding page*)

fused-air aeration tanks, two secondary sedimentation tanks, a chlorine contact chamber, primary and secondary digester tanks, sludge-drying beds, control building, and many appurtenant features.

The plant was designed so that future additions could be made as Tucson and vicinity increase in size and expanded facilities become necessary. The plant now under construction will not only receive sewage flows originating in the city of Tucson but also from the surrounding suburban area in which Sanitary District No. 1, of Pima County, Ariz., is installing a comprehensive system of sewers.

Several subcontractors assisted Sundt. Angelus Engineering Co. of Los Angeles had a subcontract for the extensive mechanical work. J. H. Welch & Son of Phoenix installed piping. Excavation was done by L. M. White of Tucson.

The time schedule may be beaten by several months. Sundt had a year from January 23, 1950, to finish the work, but Naumann expected to have the job done in 9 months. Testing should be completed by the tenth month.

Credit for that showing, he believes, belongs in large measure to the concrete forming and pouring methods which have proved so effective.

Folder on Drawing Pencil

A 4-page folder on the Mars-Lumograph drawing and tracing pencil is available from J. S. Staedtler, Inc., 53 Worth St., New York, N. Y. The circular outlines the features of this pencil for work in drafting offices.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 133.

Locomotive-Crane Catalog

A 16-page catalog on Orton diesel and gasoline-powered locomotive cranes has recently been prepared by the Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago 5, Ill. These cranes have antifriction bearings throughout and air-operated controls. All units have 3-speed and reverse transmissions, which allow loads to be lowered against the compression of the engine. All cranes can be furnished with outriggers.

The booklet describes construction and mechanical features, and gives clearance dimensions, weights of re-handling and excavating buckets, and lifting capacities. The Orton locomotive crane is made in 10 models, with lifting capacities from 10,000 to 100,000 pounds at a 20-foot radius. The units will handle ½ to 5-yard buckets.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 140.

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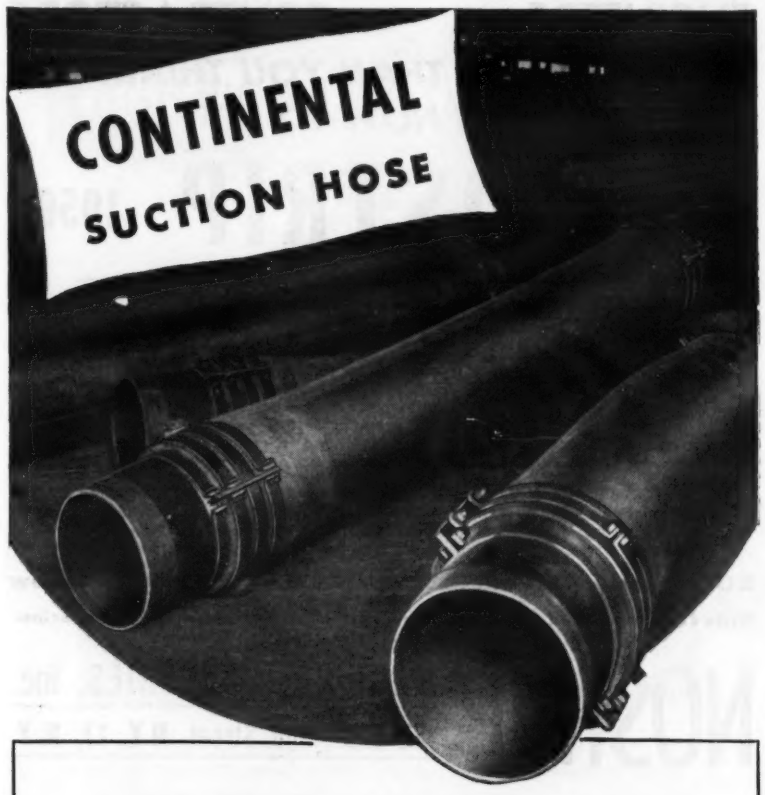

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Concord Thru-Pass Skips Capital City

New 1.8-Mile River Road Speeds Traffic on U. S. 3 in New Hampshire; Bridges Span Two Rail Lines

(Photo on Page 1)

✦ A MAJOR traffic improvement in Concord, capital of New Hampshire, was realized last year with the construction of the Concord Thru-Pass. The new 1.8-mile section of U. S. 3 bypasses the highly congested business section of the city and speeds up traffic in all directions. Besides the roadway, the project included two bridge overpasses that span the tracks of the Boston & Maine Railroad. The work was done by Peter Salvucci, a Waltham, Mass., contractor, on a low bid of $583,870 to the New Hampshire State Highway Department.

The section begins at the south end of Concord immediately after U. S. 3 crosses from the east to the west shore of the Merrimack River. The new location of the well traveled Daniel Webster Highway then turns north and continues on a recently acquired 125-foot right-of-way between the river and the main-line tracks of the B. & M. About a mile from the south end a new traffic circle permits an intersection at grade with U. S. 4 and 202, using the same east-west highway for a short distance east of Concord.

North of the circle the new route swings back to the west where two bridges carry it over, first, the Woodsville branch and then the White River Junction branch of the railroad. It then rejoins the original alignment of U. S. 3 on North Main Street in Concord. Some time in the future the Thru-Pass is expected to be extended well beyond the northerly city limits before the tie-back is made to the old highway.

C. & E. M. Photo

They look like trained elephants rearing up on command, these International KB-6 trucks. Each dumps 6 yards of gravel for the Concord Thru-Pass subbase. A D7 dozer waits to spread the material.

Two Bridges

The project was completed between April and November, 1949. Both of the bridges were subbed to Berke-Moore Co., Inc., of Boston, Mass. They are designed for H20-44 loading, and consist of reinforced-concrete piers and abutments with steel-beam stringers supporting concrete deck slabs. Both have 40-foot roadways with 5-foot sidewalks on each side. The first bridge, over the Woodsville line, has a single center pier making the two spans equal at 63 feet 10 inches. Its abutments rest on steel 8-inch H-piles, 70 to 75 feet long, and the center pier on treated-timber bearing piles. The other bridge has three continuous spans of 35 feet 8 inches, 65 feet 4 inches, and 35 feet 8 inches. Only the south abutment is on H-piles, the rest of the substructure being founded on rock.

Ready-mix concrete for the bridge pours was obtained from the Lockwood-Young Corp. of Concord. Truck mixers delivered the concrete into 1-yard concrete buckets which were discharged into wooden forms by a Manitowoc Speedcrane equipped with a 50-foot boom. The steel stringers of the bridge superstructure were also set in place by the crane.

Limited-Access Highway

The State was fortunate to find the land available for a new highway so close to the downtown business section, and yet comparatively open. Only three barns and two gasoline filling sta-

(Continued on next page)

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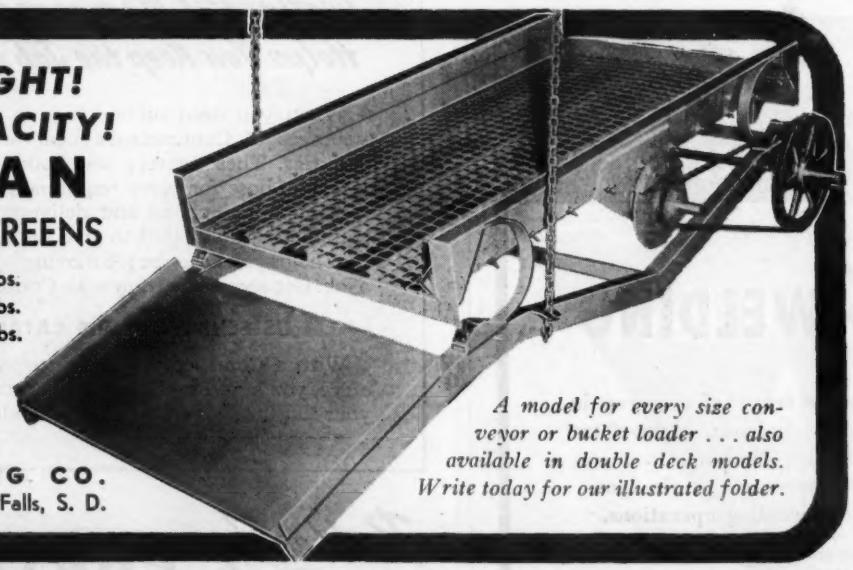

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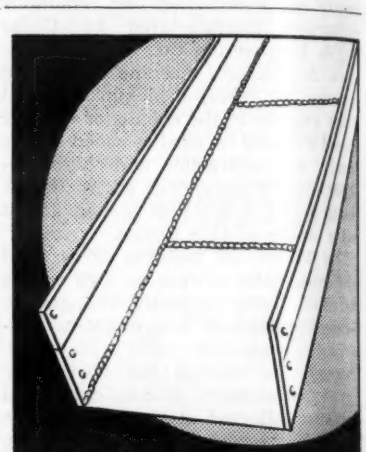

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tions had to go, and one old brick building was moved to a new location. Around 11 acres on the right-of-way were cleared and grubbed for an anticipated dual roadway some time in the future, but the grading covered only a 46-foot roadbed consisting of a 24-foot bituminous pavement flanked by 11-foot shoulders. As the new route is limited access, some 8,000 feet of 16-foot gravel roads were built so as to permit adjacent-property owners access to their land.

Road grading was primarily a fill job to get the roadbed up above possible high water along the river bank. Embankments averaged 6 to 8 feet in height, except at the railroad overpasses where the maximum fill was 35 feet. The only cuts of any size occurred in the removal of some old cinder deposits. No rock was encountered on the job. Cut slopes are 2 to 1, as are fills higher than 10 feet. In fills up to 10 feet the slopes are 4 to 1. Some 15,000 yards of topsoil was stripped off the site at the start of construction operations, and stockpiled for use later in covering the slopes with a 4-inch layer of loam. The stripping was done by dozers.

A Fill Grading Job

To get material for this highway fill job, the contractor purchased two parcels of land along the river bank, one from the city and the other from a private owner. They averaged 15 to 20 acres in size. One was at the south end and the other near the north end of the contract, which permitted both to be worked at the same time. Average hauls from the south and north river pits were 1,000 and 2,500 feet respectively. Placing of the fills started as soon as the drainage pipe was installed.

At the time of the grading, the river banks at the pits were 10 to 12 feet above the surface of the water. The upper 6 to 8 feet in the pits was dug out by shovels, of which there were two on the job—both Thew-Lorains of 1¾ and ¾-yard sizes. The last 3 to 4 feet of material that was obtained was excavated by a Lorain dragline equipped with a 50-foot boom and a Yaun 2½-yard bucket. The pits were not dug out much below water level so as to leave the ground dry for the taking of cross sections for quantity measurements.

From the south pit, where the going was somewhat rough, the material was hauled away in 3 bottom-dump Euclids carrying 15 yards; 3 Tournapulls with 12-yard Carryalls; and 2 tractor-scraper units—2 Allis-Chalmers HD-14 tractors pulling 2 LeTourneau Carryalls, one at 18 to 20 yards, and the other at 12 to 15 yards. The Tournapulls were assisted in loading by either a Caterpillar D8 snatch tractor, or an Allis-Chalmers HD-14 push tractor.

Most of the dirt from the north pit, which was served by better haul roads, was moved by 2 Sterling 7-yard trucks and a fleet of 10 new International KB-6 10-wheel 6-yard trucks.

Gravel Subbase

With this fleet of equipment the contractor placed an average of from 6,000 to 8,000 cubic yards of material in a 10-hour day. The pits yielded a good mixture of sand and fine silt which compacted well as it was spread on the embankments in 12-inch lifts. The material was always wet coming from the

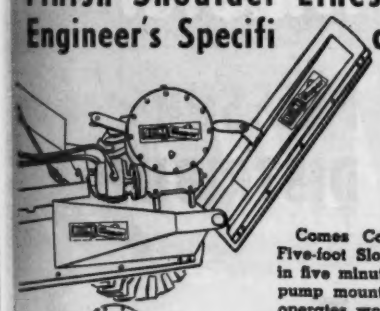
(Concluded on next page)

C. & E. M. Photo

Giving Thru-Pass plans the once-over—Superintendent Ralph Salvucci (left) and Resident Engineer Ranel W. Webb.

B-LINE Sloper attachment for No. 12 Caterpillar MOTOR GRADER

Finish Shoulder Lines and Inside Slopes to Engineer's Specifi cations in Half the Time



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and the WARCO facts behind it

It's the CAB-CONTROLLED BLADE . . . that's the first big reason why the 4D WARCO motor grader yields the high productive factor. The operator bank-slopes in consecutive passes . . . at angles up to 90° . . . and never leaves his cab. There's no need to lose expensive time in backing up or "dead-heading" . . . every foot the WARCO travels is a foot it works!

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Here's Why WARCO Yields the HIGH PRODUCTIVE FACTOR

90° BLADE TRAVEL from one side to the other, cab-controlled • RETRACTABLE SCARIFIER blade revolves 360° without removing scarifier or teeth • HIGH WORKING CLEARANCES front and rear • INTERCHANGEABLE WHEELS • MECHANICAL STEERING with hydraulic booster • HYDRAULIC CONTROLS give immediate and positive response.

Model No. and H. P.	APPROXIMATE WEIGHT IN LBS. TOTAL	ON FRONT WHEELS	ON REAR WHEELS	BLADE PRESSURE
HEAVY DUTY 4D-100				
Without Cab or Scarifier	22,879	6,617	16,262	11,900
With Cab and Scarifier	24,593	7,774	16,819	13,922
GENERAL DUTY 4D-76				
Without Cab or Scarifier	21,356	6,279	15,077	11,205
With Cab and Scarifier	23,070	7,436	15,634	13,227

W. A. RIDDELL CORPORATION • Bucyrus, Ohio

BUILDERS OF WARCO MOTOR GRADERS • HERCULES ROAD ROLLERS

Concord Thru-Pass Skips Capital City

(Continued from preceding page)

river-side pits, and the equipment in use gave it the compaction needed without resorting to rolling. State specifications called for 90 to 100 compaction, while the fills tested out from 95 to 103.

Dozing on the fills was handled by a Caterpillar D7 and an International TD-18, while the slopes were shaped by an A-C HD-7 and an Oliver HG crawler tractor using a 5-foot blade. A gravel subbase was placed over the roadbed, 12 inches thick in fills and 18 inches in cuts, the material extending out through the slope lines. The gravel was obtained from a pit on U. S. 3, 4 miles from the south end of the job, and hauled to the road in the fleet of International trucks. When necessary the material was wet down from a 3,000-gallon tank truck, and leveled off by the dozers.

The subbase was shaped by a Galion motor grader and rolled by a Buffalo-Springfield 10-ton 3-wheel roller. The 24-foot pavement has a 3-inch crown and consists of a bituminous surface treatment applied over the gravel subbase. Two shots of RT-3 tar were applied at the respective rates of 0.5 and 0.25 gallon per square yard. A cover coat of gravel was spread over each application of bitumen. The 40-foot roadway of the 175-foot-radius traffic circle, and the approaches to it, are paved with bituminous concrete. After the roadway fills on the new location have settled, that too will be paved with the higher-type plant-mix. The grades were left 3 inches low for that purpose.

Quantities and Personnel

The major items in the Concord Thru-Pass contract included the following:

Earth excavation	20,000 cu. yds.
Earth borrow	373,000 cu. yds.
Gravel base course	30,000 cu. yds.
Bituminous surface treatment	33,000 gals.
Concrete	1,188 cu. yds.
Reinforcing steel	133,350 lbs.
Structural steel	360,675 lbs.
RC pipe, 12 to 60-inch	3,626 lin. ft.
Treated-timber bearing piles	1,680 lin. ft.
Steel bearing piles	142,000 lbs.

Contractor Peter Salvucci employed an average force of 40 men on the project under the direction of his son Ralph Salvucci.

For the New Hampshire State Highway Department, Reuel W. Webb was Resident Engineer. The Department is headed by Gen. Frank D. Merrill, Commissioner. John O. Morton is Chief Engineer, and Robert H. Whitaker is Construction Engineer.

Fittings and Forgings For Wire Rope and Chain

A revised 40-page industrial and marine hardware catalog, No. 145, covering a variety of fittings and forgings for wire rope and chain, has been announced by The Thomas Laughlin Co., Portland 6, Maine. It contains the latest prices and complete engineering data on Laughlin drop-forged products. It also offers several strength and dimension tables to increase its value as a reference book.

Products listed in the catalog include the company's new clevis slip hook and grab hook, wire-rope clips, safety hoist hooks, heat-treated weldless rings, pear-shaped sling links, turnbuckle eyes, and Missing Links. Illustrations, complete dimensions, safe loads, and prices are given for each product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 30.

Portable Electric Tools

Varied portable electric tools and their accessories are presented in the new revised Catalog No. 59a issued by The United States Electric Tool Co., 1050 Findlay St., Cincinnati 14, Ohio. These tools are used in field erection, servicing and repairing construction machinery, and maintenance and production applications. The 64-page booklet describes and illustrates each of the products.

Products covered by the catalog include drills, drill stands, valve-seat grinders, valve-refinishing machines, sanders, hole saws, grinders, buffers, electric screwdrivers and nut setters, flexible-shaft machines, and accessories for these tools.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 119.

"SUCCESSOR TO GREASE" NEVER MELTS

MULTI-PURPOSE LUBRICANT

Plastilube called most important lubrication development in 20 years.

PLASTILUBE, the remarkable new multi-purpose, non-melting lubricant is today solving high-temperature and other lubrication problems for many of America's largest industrial and automotive users. In five short months, over 1000 concerns have tested and now specify this new product of The Warren Refining & Chemical Company, Cleveland.

One reason for PLASTILUBE'S sensational acceptance is the fact that it will not melt. The picture shows equal quantities of barium grease (left), lithium grease (center) and PLASTILUBE on a hot plate with a temperature reading of 345 deg. F. Note that the barium and lithium are melting rapidly while PLASTILUBE is unaffected.

In addition to the non-melting feature, PLASTILUBE possesses greater adhesion, excellent pumpability at low temperature, is exceptionally resistant to the washing action of water, and will not break down during working — allowing longer service life and consequent economy in use.

PLASTILUBE, "the successor to grease" is made by a radically new process combining Warren's I-45 and BENTONE (a product of National Lead Company). There is no comparable product on the market. It is rapidly being recognized as the most noteworthy development in lubrication since the first use of additives in motor oil twenty years ago.

For further information, samples, etc., write The Warren Refining & Chemical Co., Dept. CE-2, Cleveland 15, Ohio. *(Advt).*

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Then too, there are no gadgets to take a lot of the operator's time turning them off and on; with a "Spray Master"—one valve starts and stops the spray. "Spray Masters" are made in models up to 4000 gallons in size. Make your next Distributor the master of them all, the "Spray Master."

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A Practical Formula For Good Cheap Roads

County Finds Its Scheme Gives Dense Stone Bases And Cuts Costs of Rolling, Mixing, and Watering

By T. D. WILLIAMS, Knox County Engineer, Knoxville, Tennessee

✦ KNOX COUNTY, Tennessee, outside of the city limits of Knoxville and excluding the state highway system, has a county highway network comprising over 1,800 miles. Of these, approximately 400 miles are surfaced roads in good condition, 400 miles are surfaced roads in need of resurfacing, and the balance of 1,000 miles are macadam roads, 600 miles of which should be surfaced immediately. Just recently we prepared an estimate of the construction cost necessary to put our county roads and bridges in the shape the people would like to have them. This estimate ran in the neighborhood of $10,000,000. With the county's assessed evaluation and a reasonable tax rate, an improvement program of this capacity would have to extend over quite a period of years.

The majority of highway departments find that the cost of work to be done far exceeds the amount of money available; thus there is that ever-present tendency to save money by cutting down on the depth of base constructed. But experience continually teaches us that even if we have a stable and well drained subgrade, a pavement will not withstand traffic unless it is placed on a base course of sufficient depth and stability to transfer the wheel loads to the subgrade over an area of sufficient size to afford adequate bearing.

In our own county we find evidence of pavements that were constructed on an inadequate base of, in many cases, only 1 or 2 inches in depth. These particular roads undoubtedly held up until the winter's first freeze and thaw. You all are familiar with what happened then. Where the public felt sure they had a fine paved road in front of their homes, they found chug-holes, base upheavals, and in may cases a road that caused more wear and tear on their automobiles and dispositions than did the earth or light macadam surface it replaced.

We in Knox County have within the past three years scarified and macadamized over 200 miles of such roads. The people living along these stretches are the most dissatisfied people in the world. And they are definitely justified in their gripes, as their one-time supposedly fine bituminous highway was suddenly turned into a dusty macadam road. Needless to say, this construction procedure has been stopped and now bases of sufficient depth and stability underlie all our new pavements. Today we are building crushed-stone stabilized bases with calcium chloride added.

Plenty of Aggregate

Knox County is extremely fortunate in having an unlimited supply of limestone formation that can cheaply and readily be crushed into aggregates well suited for all types of road construction. We operate six county quarries located centrally in our six maintenance divisions, and crush the majority of stone used in both our construction and maintenance work. Naturally this crushed stone is angular in structure and possesses a good cementation quality, thus giving a good interlocking base.

We have experimented with several types of bases using a variety of aggregate gradations in order to determine that best suited for our high-type low-cost county road. As a result of our experience, we have adopted the following as our specifications on graded aggregate used as the total base mix:

Sieve Size	Per Cent Passing	
	Specifications	Used
1-inch	100	100
¾-inch	80-100	95
⅜-inch	50-90	77
No. 4	36-65	61
No. 10	22-50	38
No. 40	15-30	16
No. 200	5-15	5

The last column in the table gives a gradation being used at present. Too little material passes the No. 200 sieve, but we realize that if construction costs are to be kept at a minimum, we must use our local materials. We find that by using our own materials, we can combine approximately 60 per cent of crusher-run stone (stone not screened) and 40 per cent limestone dust (obtained when the crusher screens are installed to produce oil stone) and arrive at the gradation noted. To arrive at a perhaps more suitable gradation, additional binder soil would have to be obtained and we find this to be impractical in our location. Our soils are extremely heavy clays that are difficult to pulverize and blade uniformly into the combined aggregates. If lighter soils were obtainable, perhaps a better-graded aggregate could be used.

By constructing bases composed of limestone aggregate and limestone dust, with no additional metallic or soil binder material, we have a much greater latitude in aggregate control,

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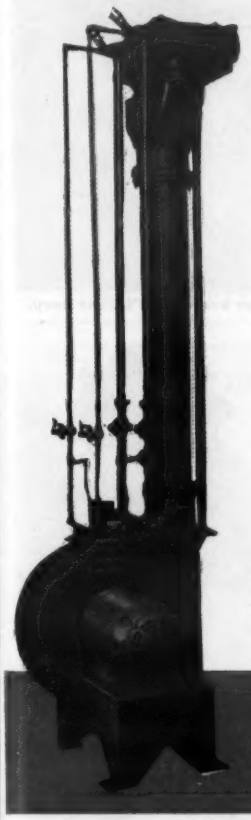

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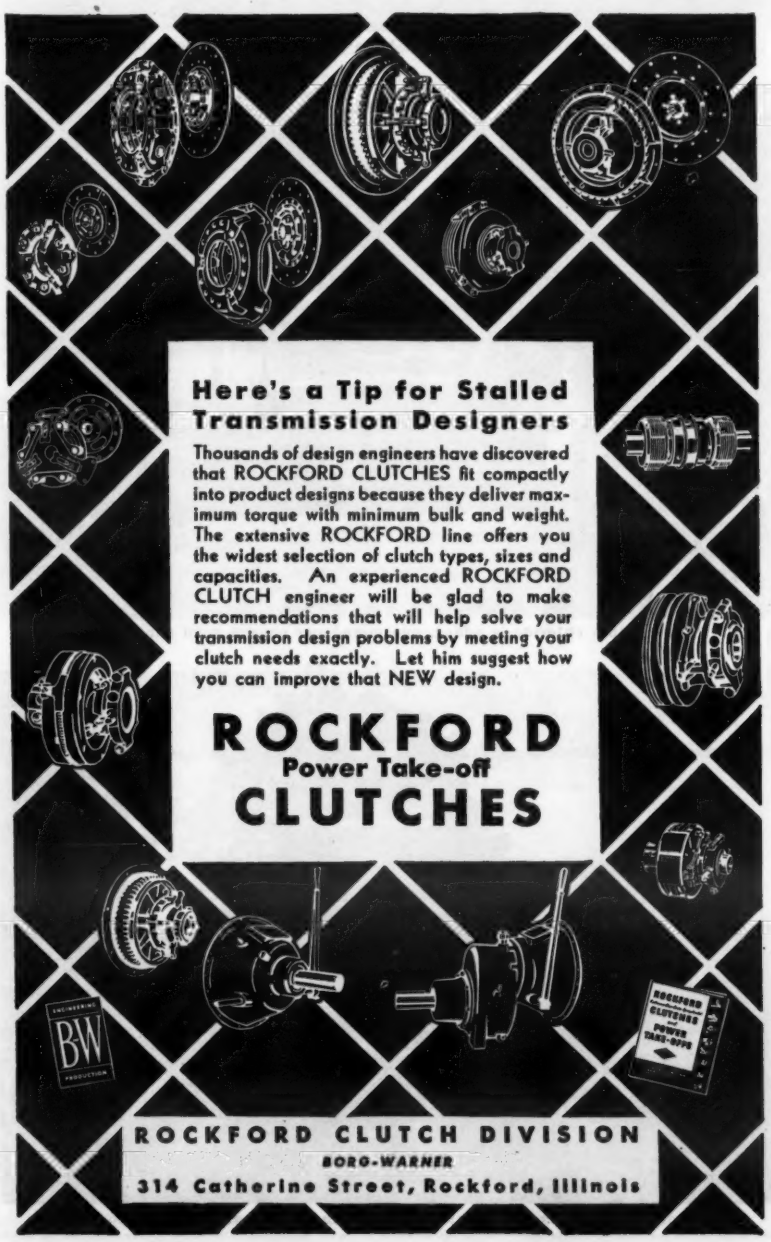
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Power Take-off
CLUTCHES
ROCKFORD CLUTCH DIVISION
BORG-WARNER
314 Catherine Street, Rockford, Illinois

1. Knox County Engineer Williams finds that this old road base averages 3 inches deep.

5. $CaCl_2$ helps to hold the moisture.

A Practical Formula For Good Cheap Roads

(*Continued from preceding page*)

mixing, and rolling. In other words, a person of reasonable experience in stabilizing these materials can by rule-of-thumb methods, such as feel and sight, quite accurately determine whether the aggregates are properly graded, mixed, and cured in preparation for final laying and rolling.

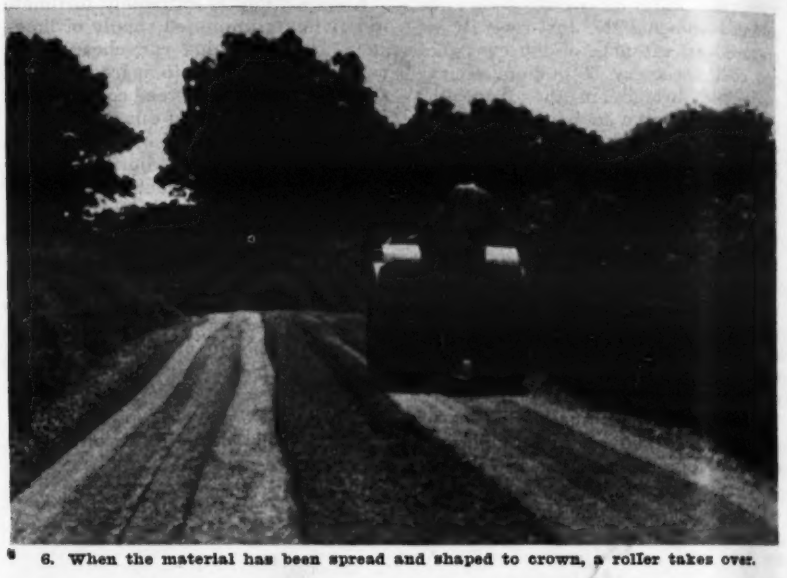
Depth of Base

The average road that we are stabilizing and surfacing is an old macadam road where stone has been added periodically and often spasmodically over any number of years, perhaps as high as thirty or forty. Our borings on this type of road show that in the usual

(*Concluded on next page*)

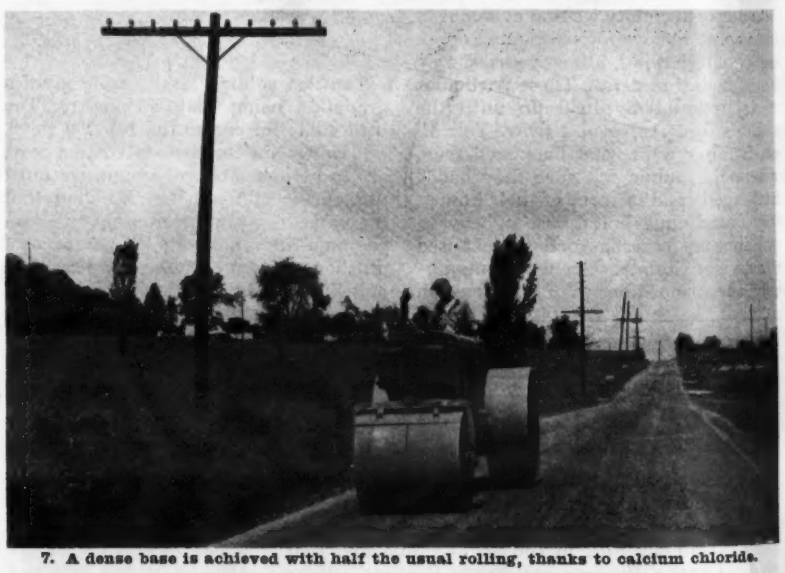
Photos courtesy of Calcium Chloride Assn.

2. Crusher-run stone and limestone dust have been laid on the road in a 60-40 ratio.

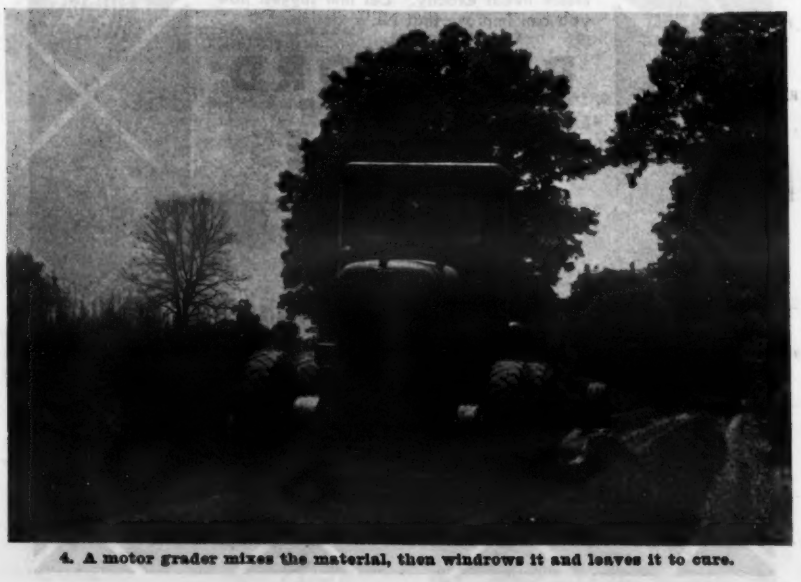


6. When the material has been spread and shaped to crown, a roller takes over.

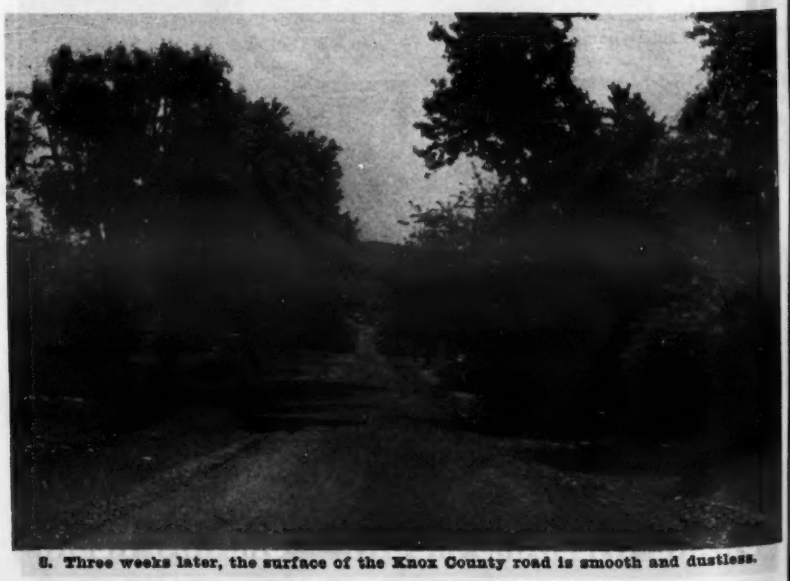
3. Then calcium chloride is added, one pound per square yard per 3-inch lift.



7. A dense base is achieved with half the usual rolling, thanks to calcium chloride.



4. A motor grader mixes the material, then windrows it and leaves it to cure.



8. Three weeks later, the surface of the Knox County road is smooth and dustless.

case we can depend upon only 2 inches of existing material that can be used in the future base. If this material is of uniform depth, adequate width, and well enough stabilized, the next lift of base material is placed directly upon it. Otherwise it is necessary to scarify the existing macadam, add material if necessary, and reshape to proper depth, width, and crown before rolling and subsequently adding the final lift.

Our roads vary tremendously in traffic volume. Depending upon location, the traffic count varies from less than 100 vehicles per day to over 5,000. The majority of roads included in our improvement program carry a traffic volume requiring the base to be constructed to a 6-inch compacted thickness. When less than 4 inches of additional compacted thickness is required to give an adequate depth, it may be constructed in one lift. If over 4 inches is required, it is compacted in layers not exceeding 3 inches.

Base Construction Procedure

Construction procedure of the base may be outlined as follows:

1. Coarse aggregates are spread on the roadway by tail-gate spreaders or spreader boxes. This operation is controlled by placing a checker on the roadway to determine the dumping distance. Unless evenly distributed, this material is leveled by a motor grader.
2. Limestone dust is added on top of the aggregate in a similar manner.
3. After a minimum of ½ mile and a maximum of one mile of aggregate is thus placed, calcium chloride is added at the uniform rate of one pound per square yard per 3 inches of lift.
4. The material is then bladed by grader from side to side until it is adequately and uniformly mixed. Water is added at the beginning and, if necessary, throughout the operation. Experience alone can teach one the correct amount of water to be added.
5. After the material is properly mixed, it is windrowed and left to cure, normally for two days. Mixing operations can proceed at another section of the project during this curing period.
6. After curing is complete, the material is again bladed to insure that no segregation has taken place, and then leveled to the proper grade and crown. Rollers, preferably 8 to 10-ton 3-wheelers, then complete the operation.
7. Once the operation is completed, the base is allowed to cure again before the second lift is added, or in the event that this second lift is not needed, before the surface is primed. Normally, when calcium chloride is used, watering during this curing period is not required. However, it is extremely important to insure against drying out too fast.

Calcium Chloride

The use of calcium chloride for bases has been discussed at great length in our organization. We doubted at first if sufficient benefits would be derived from its use to pay for its cost. To satisfy ourselves, we placed several stretches of base using the same aggregates, some with and some without calcium chloride. Our findings plainly show that the calcium-chloride base is definitely desirable and the most economical in the end.

1. The density of the completed base was found to be much greater, and this density was derived by approximately half the rolling found necessary in the bases constructed without calcium chloride. This in turn made it possible to do twice the work with our rollers that could otherwise be done.
2. Considerably less watering was necessary, especially in the hot summer months, and no watering was required to keep the base from drying out too fast.
3. Aggregates mixed more readily. It was found that approximately two-thirds the blading for proper mixing is necessary when calcium chloride is used. This is undoubtedly due to the ease of maintaining the proper moisture content during the mixing operations.
4. One of the most important advantages was found when it was impractical to surface the base within several months. During the summer of 1949 we had over 20 miles of base completed early in the season and found it necessary to leave it without even a prime coat for from two to five months, all of this being through the hot dry weather. In those bases not treated with calcium chloride, so many potholes and corrugations developed that in all cases it was necessary to scarify, reblade, and reroll the surface before priming. In several locations fines had to be added to replace those that had blown away. In those bases where calcium chloride was used, no corrugations occurred and relatively few potholes. The holes were readily filled with pre-mix material and very little blading was necessary prior to priming. One such test section was completed last August and we purposely left the top unsealed. This section, six months after completion, had withstood the dry weather of late summer and the wet winter months with practically no deterioration at all. In fact, it could be primed without any repair work. One secret to this is in giving the roadway section an adequate crown, preferably no less than 3 inches for an 18-foot surface, so as to provide adequate surface drainage. Water standing in the roadway surface will ruin a surface every time.
5. Undoubtedly considerable benefit is also derived through frost prevention. We have not made tests concerning this; however the bases have withstood the elements 100 per cent even in freezing weather. Some of these bases have been in use for over 3 years, and I personally know of others placed over 7 years ago which, almost without exception, have taken the loads for which they were designed with a very minimum of maintenance.

After experimenting and constructing bases of this type for the past three years, we have concluded that the money saved in mixing, laying, and rolling operations will practically offset the purchase cost of calcium chloride.

By June 30 of this fiscal year, we completed approximately 50 miles of this type of base. Next year's program will consist of at least that amount of mileage and we hope much more.

From a paper presented to the Committee on Calcium Chloride Soil Stabilization, Annual Meeting, American Road Builders' Association, March 7, 1950.

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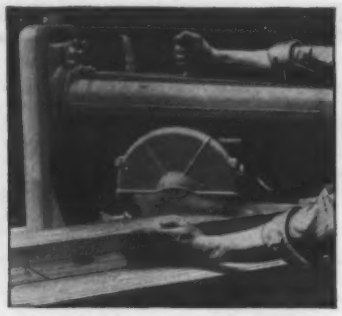


New 5-hp motors weighing only 2 pounds more than regular 2-hp motors have been developed by J. D. Wallace & Co. for its line of radial saws.

A New Motor Design For 5-Hp Radial Saw

Making use of wartime developments in magnesium applications, J. D. Wallace & Co., 176 S. California Ave., Chicago 12, Ill., has developed a 5-hp radial-saw motor weighing just 2 pounds more than its regular 2-hp motors.

The new motor designs result in high-torque drive units with more than double the power of previous machines, the company says. They are designed for heavy-duty construction and many special applications on cutoff work in both ferrous and nonferrous metals and refractory materials. For the latter applications, a table with a coolant feed is provided.

The new models of the Wallace No. 1 radial saw make use of four new-type linear ball bearings, sliding on hardened and ground-steel rods, for the frictionless pull and push of lightweight motors and frictionless slides. These machines are completely "radial" in their adjustment. The motor unit travels 19½ inches in the radial arm, in a straight line. The arm, column, and motor can all be rotated 360 degrees and locked in any convenient position, permitting use of the straight-line motor action at any combination of angles. Machines may, therefore, be used for crosscutting, angle-cutting, compound angles, ripping, bevel-ripping, dadoing, rabbetting, plowing, shaping, routing, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 51.

Truck-Body Hoist Can Load Tractors

A new hydraulic underbody truck hoist has been developed by the Henderson Mfg. Co., 1203 Rockford Road, Cedar Rapids, Iowa, to make it easy to load wheel tractors and other road equipment directly onto truck beds. The hoist and frame fit any long-wheelbase truck and can be used with most truck beds, the company says.

The hoist is designed to handle loads up to 8 tons. Double-acting cylinders operate it in both directions, regardless of the position of the load. The rear end of the truck bed rests on the ground and is inclined at approximately 25 degrees in the tilted position, making it possible to load machinery with minimum effort. The hoist pump is driven from the power takeoff of the truck engine. Also available is a hydraulic power winch which may be operated from the truck-body hoist. The winch may be mounted under the bed with the controls at the left-hand side of the truck.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 100.

Vines Follows Vines at B-E

Henry J. Vines succeeds his brother Fred D. Vines, who has resigned, as Central Sales Manager of the Bucyrus-Erie Co., South Milwaukee, Wis. H. J. Vines has been with B-E for 14 years and was formerly District Sales Representative for the New England territory. His new headquarters are in the Central Sales offices at 105 W. Adams St., Chicago, Ill.

Bulk-Cement Batcher

A bulk-cement batcher specifically designed for portability is now manufactured by Shovel Supply Co., 4900 Hines Blvd., Box 1369, Dallas 1, Texas. It holds enough cement for a dual-drum paver—up to 12 cubic feet per batch—and will handle bulk cement either at the freight car or on the job. Batching cement in bulk saves labor, time, and the cost of cement sacks, the company points out.

Scales and controls on the Ferguson batcher are located for handy operation by one man. The entire apparatus is watertight and the bin can be locked. Power is provided by a 16-hp 4-cylinder engine complete with totally enclosed gear reduction, clutch, and 4-speed transmission. A 5-minute setup is made by rotating the elevator around the center pin into working position, then retracting the wheels mechanically and setting up ramps for loading trucks. When used at the freight car, ramps are not needed; the intake bin is placed at proper height for receiving bulk cement from boxcars by means of a front-dump tractor or hand unloading.

The batcher can be ready to move in 2 minutes, the manufacturer states. The unloading ramp forms a gooseneck for attaching to the fifth wheel of a truck, or the batcher can be towed behind ordinary dump trucks. Overall height in trailing position is 12 feet 16 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 12.

New Stud Removers

Two series of threaded-collet-type stud removers and inserters have been added to the line of Snap-on Tools Corp., Kenosha, Wis. The smaller unit has 14 different collets to handle studs from ¼ to ⅝-inch diameter in both fine and coarse thread sizes. The larger model has 6 collets for ¾ to 1-inch diameters.

The company calls attention to the effective gripping power of the tapered collet which makes it possible to remove and reset a stud with only two or three threads exposed. Second important feature is that the small outside diameter slips into restricted areas. All units are precision-machined from high-grade steel and are carefully hardened and tempered.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 121.

Catalog on Motor Graders

A fully illustrated 6-page catalog on American No. 8 (gasoline) and No. 8-D (diesel) motor graders has been prepared by the American-Coleman Co., Omaha, Nebr. It illustrates the graders with on-the-job photographs showing road reconstruction, maintenance, ditching, scarifying, loading operations and snow removal. It gives complete specifications and describes the features of the graders in detail. It also mentions the various front-end attachments available.

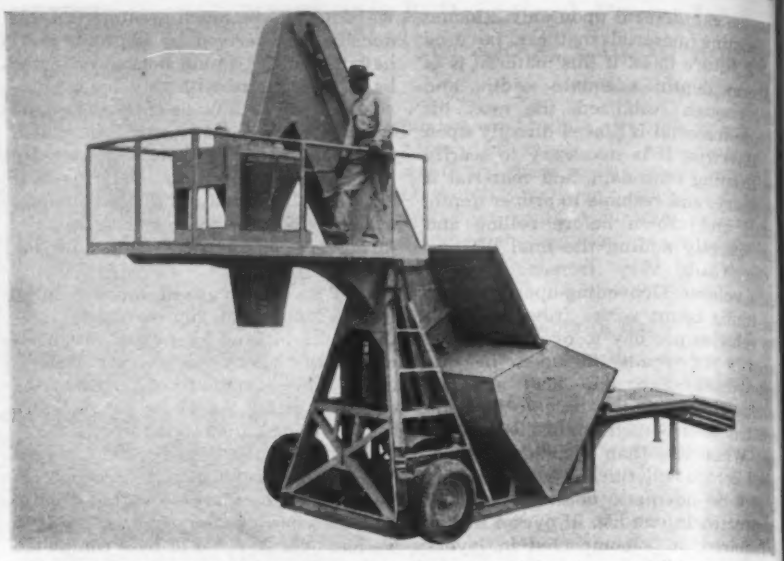
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 21.

Prestressed-Concrete Pipe

The latest folder put out by Price Brothers Co., 1932 E. Monument Ave., Dayton 1, Ohio, says that its prestressed - concrete steel - cylinder pipe has a life expectancy of 100 years. It also says that this pipe has great structural strength, and is watertight—easy to install and easy to tap.

The 4-page bulletin outlines all features of the prestressed pipe. It shows how prestressing works as internal pressure is increased, taking loads from zero through 337.5 psi. It illustrates the steps in manufacture and outlines applications. Price prestressed-concrete steel-cylinder pipe is available in 16-foot lengths and in diameters from 16 to 48 inches.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 117.



The Ferguson cement batcher set up and ready for operations. A truck will bring cement up the ramp at right and dump it into the bin. The cement is carried from the receiving bin to the weighing hopper by a chain and bucket elevator. The batch is weighed, then dropped into the batch truck.

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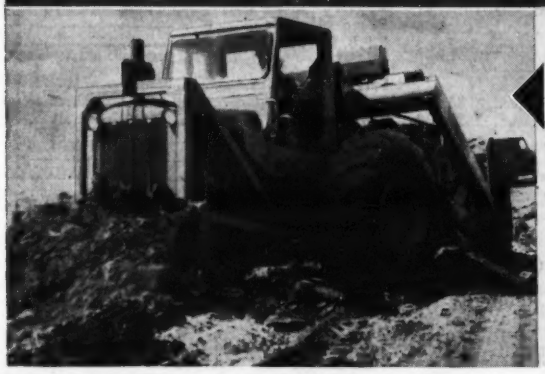

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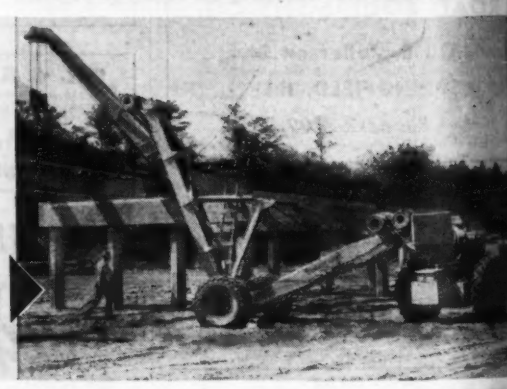
9-TON TOURNAROCKER assures steady, year-round profits. This new rear-dump hauler has 10 heaped yd., 9-ton capacity . . . low 7'0" loading height . . . 14'5" wheelbase . . . 12'2" turning radius. Easy to spot fast at shovel. Simple electric body hoist. Dumps clear over bank. Body tips vertical, cleans fast. **3**

4 **V-TYPE SNOW PLOW** has 10½' clearing width . . . 4'8" high at ends of blade. Vertical plate welded in center of V-blade opens frozen drifts . . . eliminates plowing snow back on road when widening. Adjustable runner shoe, big tires protect road surface. Works with Carryall on rear.

7-TON TOURNACRANE lifts up to 29½' — reaches 31' — handles 7 tons with exceptional maneuverability. Easy, fingertip electric control for lifting, spotting, placing. Goes anywhere — on pavement, through sand, mud — handles structural work, unloads supplies. Quickly hooked up or uncoupled as needed. **5**



6 **10-TON LOGGING ARCH** is another profitable tool for the 122 h.p. "D". With big rubber-tired Logging Arch, it hoists, skids 10-ton load of logs over rough terrain. Load clearance is 7' wide, 6'9" high inside arch. Can be used with Bulldozer on front . . . all electric control — action at touch of switch.

10-TON TOURNAHAULER . . . Big 21'3" x 8'7" flat-bed hauls heavy construction, oil field, logging, mining equipment on or off highway. Loads itself with 10-ton electric hoist. Overhead trolley reaches out 10'1¾" beyond end of bed — lifts load up to 12'1". One-man operated. Quickly pays for itself. **7**

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PEORIA, ILLINOIS

JOB-PROVED Over 6750 Built and Shipped

TOURNAPULLS

FOR LOWEST NET COST PER YARD